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THE PRESENT STATUS OF CONVALESCENT SERUM THERAPY *

W. H. KELLOGG, M.D.
BERKELEY, CALIF.

A discussion of the application of convalescent serum therapy will naturally resolve itself into a consideration of the prevention and treatment of two diseases only, poliomyelitis and measles, because of the several diseases in which convalescent serum has been tried or suggested, only these two seem to deserve mention.

Convalescent serum has been found to be effective in preventing measles, but is useless as a cure once the disease is established. Although attempts to immunize children against measles by the injection of human blood were made nearly 200 years ago by Home of Scotland, it was not until 1916 that further serious consideration was given to the question. Nicolle and Conseil, and also Parke and Zingher, in 1916, reported on the use of convalescent serum for the prevention of measles in children recently exposed. Since then many articles have appeared on this subject,[1] notably those of Park [2] and his associates in this country and of Degwitz and of Debré [3] abroad. The sum and substance of the work of all these investigators is that convalescent measles serum injected into children exposed to measles will, according to the potency of the serum, the amount used and the stage of the incubation period in which it is given, either give complete passive immunity and prevent infection or give partial immunity and permit a mild attack, which nevertheless confers active immunity; or it may have no effect whatever. As the result of their experience with 1,500 children, Park and Freeman consider that 6 cc. of convalescent serum or plasma for a child under 3 years of age, and from 6 to 10 cc. for an older child, is sufficient as a rule to prevent infection, and, in the few cases in which it fails, the attack is almost certain to be mild and uncomplicated.

The case for convalescent serum in poliomyelitis is more difficult to establish, as the investigator who attempts to evaluate the many reports of its use is immediately confronted with evidence of confusion and of inadequate data. Notwithstanding the fact that a published article on the subject is likely to place the facts observed in the most favorable light for the cause of convalescent serum therapy, one can hardly avoid a feeling that the case for serum is not convincing after perusing most of the clinical reports. This is because there are some inherent obstacles to a scientific conclusion with the data ordinarily available. Perhaps for this very reason my conclusions, unsatisfying as they are, may at least have the merit of an unbiased point of view, because I am not a clinician and so far as this particular disease is concerned am not as yet an experimenter with immune serums either human or animal.

Whether or not acute anterior poliomyelitis is a new disease, one fact is indisputable, and that is that it is now showing a tendency to occur in epidemic form more frequently and in larger outbreaks than during the first few years following the observations of Medin, Wickman, Wernstedt, Caverly and others around the beginning of the present century. This fact, plus the high fatality rate, the frequency of permanent disability in those who recover and the absolute lack of any form of effective preventive measures, accentuates the need for a specific curative agent.

The development of a specific immunologic method of treatment depends absolutely on inoculation experiments either in man or in some lower animal. In the case of poliomyelitis, human experiments are obviously out of the question, and the only animal that has been found to be susceptible to inoculation with the virus is the monkey. Landsteiner in 1909 was the first to inoculate monkeys, and soon afterward Flexner and Lewis [4] demonstrated passage of the infection from monkey to monkey. Briefly stated, it has been demonstrated by monkey experiments that convalescent serum is virucidal; that is, it protects monkeys from an intracerebral inoculation when mixed with the virus before injection. It also protects against an intracerebral inoculation when it is injected intrameningeally and intravenously. It is true that serum given intravenously does not find its way to the cerebrospinal fluid except in the presence of injury to the choroid plexus, according to Flexner and Amoss,[5] but the inoculation of the virus intracerebrally upsets this delicate balance, which can be disturbed even by aseptic inflammatory substances and thus the passage is permitted of the immune bodies through the meninges to the involved structures of the central nervous system. It has also been shown by work on monkeys that the probable portal of entry of the infection is the nasal mucous membrane, the virus passing up the lymph channels of the olfactory nerves.[6] The virus having thus passed the epithelial barrier, the anatomic integrity of the choroid plexus and meninges still acts as a restraining influence but one which, as has already been pointed out, may be easily broken down. These, then, are the facts, and

* Read before the Section on Preventive and Industrial Medicine and Public Health at the Eightieth Annual Session of the American Medical Association, Portland, Ore., July 12, 1929.

1. A good bibliography of the subject is given by Hass, S. V., and Blum, Julius: Prophylactic Value of Blood of Convalescents in Measles, J. A. M. A. **87**: 558 (Aug. 21) 1926.

2. Park, W. H., and Freeman, R. G.: The Prophylactic Use of Measles Convalescent Serum, J. A. M. A. **87**: 556-558 (Aug. 21) 1926.

3. Debré, R., and Joannon, P.: Convalescent's Serum in the Fight Against Measles, Ann. de méd. **16**: 309 (Oct.) 1924.

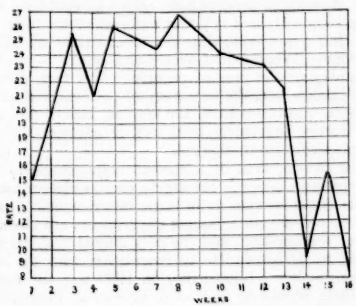
4. Flexner, Simon; and Lewis, P. A.: Experimental Poliomyelitis in Monkeys, J. A. M. A. **54**: 1780 (May 28) 1910.

5. Flexner, Simon; and Amoss, H. L.: J. Exper. Med. **25**: 499 (April) 1917; **28**: 11 (July) 1918.

6. Flexner, Simon: Bull. New York Acad. Med. **5**: 252 (March) 1929.

the only facts we have, on which to base a scientific reason for the use of convalescent serums, until we find unimpeachable clinical evidence in support of its use for the cure of poliomyelitis.

If, as is maintained by some, the invasion is not always as direct as Flexner believes but is first a systemic invasion, the observations of Flexner and Amoss on the passage of serum [5] and of Netter [7] on the passage of virus from the blood stream to the spinal fluid in the presence of an aseptic inflammation of the meninges suggest that the intraspinal route for serum therapy may be dangerous unless, as believed by Flexner, the injected serum carries without question virucidal antibodies. Clinical reports seem at times to be contradictory of this experimental conclusion and thus apparently to deny the early invasion of the blood stream. For example, Silverman [8] reports that fourteen cases diagnosed early were treated by the injection of normal horse serum intraspinally and in nine of these paralysis failed to develop (64 per cent). If the blood stream had been invaded and the central nervous system not, it would have been expected that the horse serum, having no virucidal power itself, would have served only to break down the integrity of the choroid plexus



Case fatality rate by weeks in the New York epidemic.

and thus to invite invasion of the central nervous system. Since there is a rapid transfer of horse serum to the general circulation, when it is injected intraspinally, the possibility of a favorable nonspecific protein effect coming into play would seem to require consideration. Except for statistical errors shortly to be mentioned, how else can be explained the favorable reports of treatment with animal serums supposed to carry immune bodies, but which in the light of carefully controlled animal experiments cannot be shown to have any virucidal property? As to normal homologous serum, Aycock and Kagan [9] conclude that the neutralizing effect which has actually been observed is evidence of acquired immunity and not a property of normal serum.

The literature abounds with favorable reports on the use of certain curative serums of animal origin for poliomyelitis, such as Rosenow's antistreptococcic serum from horses, and Pettit's, which is from both the horse and the sheep. Watkins and McKenzie,[10] in a paper concerning the Detroit epidemic, report nineteen cases treated with convalescent serum, with cures in 26 per cent, improvement in 10.5 per cent and no effect in 63 per cent. The dosage was 20 cc. and repeated either intraspinally or intramuscularly. They then treated thirty cases with Rosenow's serum, with cure in 53 per cent, improvement in 10 per cent, and no effect in 30 per cent, an apparent improvement over the human serum. This report brings to mind one of the several difficulties that form a bar to a proper evaluation of any measure that is being used to prevent paralysis and to save life when one is dealing with poliomyelitis. Reference is made to the difference at various stages of the epidemic in the expectancy of the individual case. This is shown in the increase in the severity of the cases, as demonstrated by the percentage paralyzed, and in the rising case fatality rate as the epidemic progresses, followed by a rather rapid fall in these characteristics toward the end of the outbreak. This is well illustrated by the New York City epidemic of 1916, presented graphically in the accompanying chart, in which the case fatality rate rose from 15 per cent in the first week to 26.7 per cent in the eighth week, and then fell to 8.5 per cent in the sixteenth week.

Manifestly, any comparison of the results of two methods of treatment which are applied at different periods of time in the same outbreak will yield misleading results. Rowan,[11] in his report of cases treated with Rosenow's serum during an epidemic in Dubuque, apparently had this in mind and forestalled this type of objection by bringing out the point that treatment with serum was begun before the crest of the wave was reached. In his series, seventeen untreated cases gave a mortality of 47 per cent, while sixty-eight treated cases showed a mortality of only 2 per cent. Notwithstanding the statement that the second series was begun before the peak of the epidemic, I still feel that I would like to see a tabulation of the individual cases with respect to the fatality curve of the epidemic, especially since the curve of morbidity may not coincide. Most reports comparing results between treated and untreated cases are open to the criticism that the division of cases into the two groups has been by a species of unconscious selection. The clinician in assembling his case histories for the purpose of defending an impression gained in treating patients with serum segregates them according to whether or not serum was given, and the reason for the variation in treatment, usually not given, may have a bearing on the statistics that is overlooked in the compilation of the data. If serum is withheld from one because it is obviously too late, by reason of the existence of paralysis, or because of the extent of the paralysis, and is given to another because this case has come to the attention of the observer soon enough to be promising, a distortion of facts in favor of the serum treatment occurs. Of course, not all statistics carry errors as crude as this, but similar errors occur in less readily recognizable form.

The question of the accuracy of diagnosis is sure to be brought up in the consideration of a tabulation of a series of successfully treated cases of poliomyelitis. The question is of importance, but the error from this source is usually impossible of correct adjustment. Each examiner of statistics will make his own mental appraisal of this factor from a mixture of his knowledge of the clinician whose report is being considered and a study of the data, not always complete. The

7. Netter, A.: Bull. Acad. de méd. **74**: 403, 1915, quoted by Shaw and Thelander.
8. Silverman, A. C., in discussion on Aycock and Luther (footnote 12).
9. Aycock, Lloyd; and Kagan, J. R.: J. Immunol. **14**: 85-142 (Aug.) 1927.
10. Watkins, J. T., and McKenzie, E. D.: Ann. Clin. Med. **4**: 149 (Aug.) 1925.
11. Rowan, J. J., Jr.: M. Rec. **96**: 972 (Dec. 13) 1919.

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abstract scientist, however, requires proof of the acceptability of all the factors of the problem, and the considerable degree of question as to this point of diagnosis that attaches to many of the reports on convalescent serum therapy only emphasizes the truth that medicine is not in all particulars an exact science. The importance of this matter is recognized by some writers in the care they have taken to establish the authenticity of their cases. This, of course, adds value to their conclusions, but there are other factors against which diagnostic skill is of no avail.

The vagaries of epidemic disease in the rise and fall of so-called virulence, thus causing a variation in the case fatality rate from time to time, are not less noticeable with poliomyelitis than with other diseases, and this introduces a factor that cannot well be reckoned with by any method short of a cold blooded alternation of cases—one treated and the next untreated. A physician dealing with the lives of children instead of guinea-pigs naturally shrinks from such a procedure if he has any confidence at all in the treatment under investigation. With convalescent serum there is definite evidence from monkey experiments that it neutralizes the virus and prevents infection, but the application of this knowledge to the prevention of paralysis in children is a different matter. For one thing, the infection is already implanted when the serum is given to a child with a diagnosis of poliomyelitis, while in monkeys the serum has been more effective in preventing infection than in curing it after it is established. Tests in the practical application of this remedy are therefore necessary and these tests must be more thoroughly controlled than any hitherto reported; else the true value of the serum will continue to be a subject of question. Some of the ways in which error can creep in have already been mentioned, and their operation is seen in the supposedly conclusive reports on the use of serums having no value as proved by neutralization tests. If a serum does not stand the test of virus neutralization in the laboratory no amount of favorable case reporting in the absence of a controlled experiment, such as that involved in the alternation of cases, will satisfy, and, on the other hand, even though the monkey experiments indicate the effectiveness of convalescent serum, as they do, this does not absolutely clinch the matter for application to human beings, which can be done only by properly controlled trials of the serum in actual human cases. In appraising such tests of human serum, the same opportunities for error exist as in the use of animal serum, and the same need for controls exists.

Aycock and Luther,[12] in a convincing paper on the preparalytic administration of convalescent serum, report on 106 cases treated. They have taken care of the question of diagnosis better than most other authors. They excluded purely abortive types (no meningeal symptoms at all) and spinal fluid examinations confirmed their diagnoses. The good results of the preparalytic administration of serum in these cases seems almost beyond question, but if this is to be a critical analysis some attention must be given to any defects in a positive demonstration that can be found. The authors state that every patient seen by them within the first four days of the onset of the disease, and in whom paralysis had not yet appeared, was treated with serum, and they had a fatality rate of 0.9 per cent, some paralysis subsequently developing in 65 per cent of all treated cases. One could wish that they had recorded also all cases seen by them too late for the use of serum (because of the beginning of paralysis), together with information as to the duration of the preparalytic stage in these cases and the end-results. This would offset a natural suggestion that since fatal cases as a rule present an early paralysis, their group is in fact so selected as to exclude fatal cases. The untreated patients used by them for comparison were those who applied for aid at the clinic of the Harvard Infantile Paralysis Commission. They were therefore probably not seen by the authors during their attack, and, as controls, they suffer a loss in value. Controls should be subject to identical conditions in all respects except the measure under investigation. The comparison of the mortality in the treated group with that of the state at large seems fair enough at first glance, barring the possible inclusion of mild cases due to superior diagnostic ability, but it is interesting to consider what would have been the outcome if some one had treated 100 cases in Alameda County, California, in 1927 and then compared the mortality in that group with the mortality of the state at large. In Alameda County there were reported 121 cases (exclusive of a few in which the diagnosis might have been doubtful) in which practically no serum of any kind was used, and there were six deaths among the 121 cases, or just short of 5 per cent. The case fatality rate for the state at large was 18.25 per cent. The variation in severity of the disease in different localities at the same period of time and in the same locality at different times renders it necessary to use great caution in comparing the mortality of cases not absolutely the same in time and place. In Del Norte County during the same period the mortality was nearly 28 per cent and in Glenn County the mortality was 31 per cent. To show what may happen to the statistics of a special treatment in one of these areas of high fatality, Kern County with seventy-six cases and twenty-one deaths, or 27.6 per cent, had six deaths in thirteen cases treated with Rosenow's serum.

The medical research committee of the University of Manitoba[13] has published a study of 161 cases treated with convalescent serum. In group 1, consisting of fifty-seven cases, one dose of serum was given intramuscularly in the preparalytic stage. The complete recoveries in this group were 93 per cent; the residual paralyses, 7 per cent; deaths none. In group 2 seventeen patients received two or more doses by various routes in the preparalytic stage. The complete recoveries were 94 per cent; residual paralyses, 6 per cent; deaths none. In group 3, thirty-three cases, the serum was given by various routes after the onset of paralysis. The complete recoveries were 22 per cent; the residual paralyses, 45 per cent, and deaths, 33 per cent. In group 4, consisting of fifty-four cases, serum was not given. In this group the complete recoveries were 26 per cent, the residual paralyses 63 per cent and the deaths 11 per cent. It will be observed that the group receiving serum after the onset of paralysis had a fatality rate three times as high as the group not receiving serum. The article, as is usual, is not clear as to how the control group was selected, but, however, it may have been, no case is made for the administration of serum after the onset of paralysis. As to the other two groups, the record is excellent; but the doubt previously referred to as attaching to most reports of this kind is in evidence; namely, there is no control to show that groups 1 and 2 are

12. Aycock, W., and Luther, E. H.: Preparalytic Poliomyelitis, J. A. M. A. **91**: 387 (Aug. 11) 1928.

13. Report 1 of the Department of Health and Public Welfare, Great Western Life Assurance Company, Winnipeg, Canada.

not really selected. In the report, the statement is made that in group 3 (serum given after paralysis) the onset of paralysis was earlier than in groups 1 and 2, in which the serum was given in the preparalytic stage. In view of the fact that, the earlier the paralysis, the more grave the prognosis, it may be that the good result of treatment in the preparalytic cases occurred partly because these cases were predestined for a better prognosis.

For a small but uncontrolled experiment, the group of twelve cases reported by Macnamara [14] in Australia is about as circumstantial as any. All were treated intrathecally with convalescent serum, one in the preparalytic stage and two within twenty-four hours after the onset of paralysis. Six patients had had paralysis (one bulbar) for from thirty to fifty hours. Three were given serum when death from respiratory paralysis seemed imminent. There were no deaths in this group, and no extension of paralysis occurred after treatment.

Clinicians differ in their ideas as to whether the administration of convalescent serum should be into the blood (intravenously or intramuscularly) or into the spinal canal. There is no doubt that for curative purposes the serum must reach the cerebrospinal fluid, so if this is accomplished by the intramuscular route that should suffice. Shaw and Thelander [15] report forty-three cases treated with convalescent serum by intramuscular injections. The results in this group, twenty-four of which were treated after the onset of paralysis, were thirteen residual paralyses and five deaths, being better than for the state at large but not as good as in Alameda County where little serum was used, again illustrating the pitfalls in evaluating clinical reports. The manner of selecting the control group of thirty-three cases, which showed more residual paralyses but a lower death rate, was not indicated. According to the experiments of Flexner and Amoss, previously referred to, the serum thus applied cannot reach the spinal fluid in the absence of a defect in the choroid and meningeal barrier.

Perhaps the onset of meningeal symptoms indicates that this barrier is permeable and serum given previous to this occurrence will be then immediately available. The same authors refer to the danger of spinal puncture, while others express a reluctance to perform spinal puncture for diagnostic purposes on the ground that harm may result in the annoyance and disturbance of the patient, if not in the operation itself. Macnamara [14] suggests the danger of removing much spinal fluid because of possible injury to the choroid plexus and migration of the infecting agent from the circulation through the meninges. He cites three possible instances of this kind in which serum was given in the preparalytic stage with an interval of from twelve to eighteen hours between the taking of fluid and the administration of serum. All the patients developed paralysis. If, as is suggested, the spinal drainage was responsible for the development of paralysis, perhaps if the serum had been given at the time the fluid was removed this outcome would have been prevented. Montgomery and Cole [16] report twenty-six cases, twenty of which were seen before the onset of paralysis. Spinal puncture was done in all cases and repeated one or more times until the pressure had definitely subsided. In all cases the spinal fluid examination confirmed the diagnosis of poliomyelitis. There were no deaths and there were ten cases of paralysis, four permanent. No instance of paralysis occurred in any case in which drainage was done the first day (five in all), and only one case of paralysis appeared among those in which drainage was done on the second day (eight in all).

Diveley [17] says that early spinal drainage was used in only twelve of the cases he reported, but that when drainage was practiced it was definitely shown not only that the cord involvement was lessened but that in many cases residual paralysis was prevented. The value of this observation, as well as that of Montgomery and Cole previously referred to, is restricted, of course, to the demonstration of harmlessness so far as that can be shown by the limited number of cases. These, together with the large series of cases treated by intraspinal injection by Aycock and Luther, would seem to indicate that there is no real objection to the spinal route, and it has theoretically the advantage of a quicker and more concentrated application of immune bodies to the appropriate region.

The intramuscular method, is, of course, more convenient, while the intravenous injection will not be found by many to be easier of performance than intraspinal puncture. Whole blood may be used in an emergency intramuscularly, and in the administration of serum, the question of blood type need not be considered even for intravenous use.[18]

In the pursuit of material on which to base an opinion regarding the value of convalescent serum, the attempt to collect information from physicians regarding the few cases each may have had in private practice has been futile. The Hooper Foundation for Medical Research of the University of California collected and distributed a considerable amount of convalescent serum during the 1927 epidemic. From the list of physicians who had been supplied, about fifty were selected to whom questionnaires were sent. Twenty answers were returned, and of these, seven reported either that the serum had not been used or that the final diagnosis was not poliomyelitis. Of the remaining thirteen physicians, four, with a total of six cases, believed the serum should be credited with the cures. Six, with a total of fifteen cases, had no opinion to offer, and in one case in this group the condition was recorded as becoming immediately worse after intrathecal injection of 20 cc. of serum, death resulting. Two physicans, each with one fatal case, thought that the serum was given too late.

SUMMARY AND CONCLUSIONS

Having shown how easy it is to pick flaws in the evidence presented by most reports on the use of convalescent serum—having in fact, as I believe, shown that so far there is no conclusive scientific evidence of the value of convalescent serum secured by absolutely controlled experiment—I must add one more comment, and that makes it necessary to drop for the moment the rôle of scientific investigator. My impres-

14. Macnamara, M. J.: M. J. Australia **2**: 266 (Sept. 1) 1928.

15. Shaw, E. B., and Thelander, H. E.: Intramuscular Use of Convalescent Serum in Treatment of Poliomyelitis, J. A. M. A. **90**: 1923-1927 (June 16) 1928.

16. Montgomery, J. C., and Cole, W. C. C.: Spinal Drainage, J. A. M. A. **85**: 890 (Sept. 19) 1925.

17. Diveley, R. Z.: J. Bone & Joint Surg. **11**: 100-122 (Jan.) 1929.

18. For details of the technic of the collection of blood, the preparation of the serum and its administration, the reader is referred to the article by Aycock, Luther and Kramer (Technic of Convalescent Serum Therapy in Poliomyelitis, J. A. M. A. **92**: 385 [Feb. 2] 1929), which gives the technic for collecting large quantities of blood. The author, however, would prefer to use a smaller needle, about 20 gage, and a 100 cc. Luer syringe, taking only 50 or 100 cc. at a sitting. With a small, sharp needle, a dexterous operator and a minimum of apparatus and fuss, the donor will cheerfully consent to multiple bleedings, particularly if paid for it. Blood serum should be pooled from several persons, and it is better to have a list of willing donors of comparatively small amounts than to secure larger amounts from persons unwilling to undergo a second bleeding.

sion, gained from an analysis of the reports of a few of the writers who seemed best armed with careful observation, is that convalescent serum is of value in the treatment of poliomyelitis, and that its use should be encouraged and extended.

Several facts seem fairly conclusive from the literature studied. These may be stated as follows:

Whatever benefit may be expected from convalescent serum can be realized only when it is given in the preparalytic stage.

The intrathecal route would seem to be as safe, and certainly as effective, as less direct methods.

The intramuscular or intravenous route is possibly as effective as the intrathecal, excepting for a certain amount of delay in reaching the spinal fluid with antibodies, but further studies on this point are desirable.

The prophylactic use of convalescent serum given subcutaneously or intramuscularly in time of epidemic, as suggested by Flexner, is amply backed up in its rationality by monkey experiment and is probably a valuable preventive measure, albeit limited in application by difficulties in obtaining serum.

Further information on the value of convalescent serum is needed and, in the prosecution of studies, the prime requisite is a real control represented by a series of untreated cases in every respect the same as the treated cases. This similarity must include time, stage of the epidemic, and clinical type.

Every published study should give full details as to how and why certain cases were selected for controls.

Published studies on the effect of convalescent serum should exclude all abortive cases on account of the uncertainty of diagnosis. Characteristic symptoms of central nervous system involvement should be present and cases in which spinal fluid examinations are not made should be tabulated separately.

In view of the widespread immunity to poliomyelitis indicated by the low attack rate, the possibility that the so-called normal serum of young adults may frequently carry immune bodies in serviceable amounts, and the difficulties in the way of securing an adequate supply of known convalescent serum, it is suggested that an experiment with normal serum would be worth while.

ABSTRACT OF DISCUSSION

DR. E. B. SHAW, San Francisco: In our own small series of cases, to which Dr. Kellogg referred, in 100 per cent of those treated before the onset of paralysis there was no subsequent paralysis. In cases treated later there often appeared to be benefit, but this was a matter of opinion. We included untreated cases for the sake of a rough comparison, but from the fact that these do not constitute satisfactory controls, we carefully avoided designating them as such and avoided comparative percentages with regard to residual paralysis. I do not agree with Dr. Kellogg that alternate cases might be chosen satisfactorily. If one were hardy enough for such an experiment, the extreme variability of the disease might cause statistics to be confusing. Such an experimental study could be effectively undertaken only in an epidemic of great extent or severity and then only under careful clinical observation. Family epidemics are often significant. One child had had a recent injury to his left arm. He came under observation because of fever and slight stiffness of the neck, which was believed to be accounted for by swollen glands. Over night he developed a paralysis of the injured arm, which has persisted for more than four years. A few days later his younger brother was brought in with almost equally vague signs. Lumbar puncture revealed a cell count of 260. He was treated with convalescent serum intramuscularly and recovered without paralysis. Another boy, with rather slight symptoms and a cell count of 135, recovered promptly. It was thought that he might possibly have had an abortive case. A few days later, however, his brother was brought in because of paralysis that had appeared following a slight indisposition. A sufficient number of similar cases carefully observed might justify clinical opinion even though they do not conform to conditions of animal experimentation. The method of employment of the serum depends on the pathologic manifestations. Meningitis is best treated by intrathecal injection, but poliomyelitis, while it produces meningeal reaction, causes no very definite meningitis. The virus can rarely be recovered from the spinal fluid, but can be from the depths of the brain and cord and from many other organs. The lesions in the central nervous system and elsewhere are definitely perivascular. These occurrences strongly suggest that dissemination occurs by way of the blood stream and that treatment may best be employed through the same route.

DR. A. J. SCOTT, JR., Los Angeles: I wish to cite the work of two of our leading southern California institutions. The Orthopedic School and Foundation furnished the following data: Started to collect serum in 1925; supplied in southern California, Arizona and Salt Lake City; number of physicians, seventy-five; number of hospitals, two; number of patients, 100; number of cubic centimeters of serum distributed, 3,800; number of children who donated serum, fifty-seven; number of children who donated once, thirty-five; number of children who donated twice, four; number of children who donated three times or more, sixteen; largest number from any one child, eight times in two years; amount removed at one time, 100 cc. of blood, and amount of serum obtained, approximately 40 cc. Most of this serum was used in the Los Angeles General Hospital, and to Dr. Mary Bigler, the resident in the contagious department, I am indebted for the following information:

	Convalescent Serum			No Convalescent Serum		
	1927	1928	Total	1927	1928	Total
No residual paralysis	6	8	14	9	5	14
Residual paralysis	10	7	17	35	3	38
Died	7	5	12	13	2	15
Totals	23	20	43	57	10	67

I shall quote from her letter, as follows: "The figures are very unsatisfactory for two reasons. First, patients varied so widely in amount and in type of paralysis or symptoms and in number of days illness before entering the hospital; and second, during the latter part of 1927 and all of 1928, every patient in critical condition was given convalescent serum. This makes the death rate higher for the treated than for the untreated cases. Of the two patients who died during 1928, one was dead on entering the hospital and the other was diagnosed only a few hours before death." The serum was usually given intramuscularly, sometimes intravenously, and in three cases intraspinally. The dosage in 1927 averaged 10 cc. and in 1928, from 30 to 75 cc. Dr. Bigler remarks: "We noticed marked improvement in those who recovered and who received the higher dosage. No patient paralyzed more than forty-eight hours received the serum unless critically ill. Those benefiting from the serum entered the hospital early in the course of the disease and received 20 cc. or more of serum. Paralysis did not increase in any patient after administration of serum except in those showing respiratory paralysis on admission. Recovery or improvement in about fifteen of the treated cases was so phenomenal as to convince us all of its value."

DR. W. H. KELLOGG, Berkeley, Calif.: I imagine that it sounded very much as though my paper was one of criticism, but it was not so intended. It is in criticism of the facts that one is able to dig out of the average clinical report. I merely gave the scientific aspect.

Early Transfusion.—In 1667 Jean Baptiste Denys, physician to Louis XIV, performed a blood transfusion on a youth, introducing sheep's blood into the veins of his patient. This was probably the first successful transfusion.—Hullsiek, H. E.: Blood Transfusion with a Report of One Hundred and Fifty Cases, *Minnesota Med.*, December, 1929.

THE GASTRIC MANIFESTATIONS ASSOCIATED WITH A SPASTIC COLON *

FRED M. SMITH, M.D.
G. H. MILLER, M.D.
AND
W. M. FOWLER, M.D.
IOWA CITY

It is generally recognized that the symptoms of recurring epigastric pain, nausea and vomiting which are usually part of the clinical picture of gastric disease may sometimes be associated with more distant lesions, such as chronic infections of the gallbladder and appendix. It is not so generally appreciated, however, that the same symptoms are also commonly associated with a chronic spastic condition of the colon.

The type of pain under discussion is localized in the epigastrium and often to the right and above the umbilicus. It may occur at intervals of from one to three hours after meals and is described as a sensation of fulness, burning or gnawing or a cramplike distress. These features of the discomfort resemble closely those of a peptic ulcer. They are, however, invariably associated with bowel symptoms, such as a feeling of fulness or even cramps over the lower part of the abdomen and the consciousness of gas. This distress is furthermore not always relieved by the taking of food or of sodium bicarbonate except when the latter is followed by the eructation of gas. It is relieved by the passage of gas by bowel and bowel movement. It is intensified by any aggravation of the bowel condition and is most prominent when the stools are scybalous or pencil-like in character. It may be experimentally induced by the distention of the stomach with air or by inflation of the colon.

REPORT OF CASES

Many of the features of the gastric distress here described are illustrated by case 1.

CASE 1.—Mrs. P. E., aged 35, admitted to the University Hospital in January, 1929, gave a history of having had periods of abdominal discomfort for from six to seven years. She at first noticed a feeling of heaviness and fulness in the epigastrium and occasional cramps over the lower part of the abdomen. Later the distress in the epigastrium became gnawing and burning in character and appeared from one to three hours after meals. She was frequently awakened at 4 or 5 o'clock in the morning by the distress. There was a history of relief following food, but sodium bicarbonate gave relief only when followed by the eructation of gas. The sodium bicarbonate was taken in teaspoonful doses and might be repeated several times before relief was obtained. The appendix had been removed in October, 1926, but there was apparently no significant pathologic change. The gallbladder was examined at the time and reported to be normal. Following the operation the patient was relatively free from discomfort until September, 1928. At this time she was under a heavy nervous tension because of the illness of her mother. The pain in the epigastrium returned, and, as before, occurred from one to three hours after meals. She also began to have more trouble with the bowels and felt certain that the epigastric distress was induced by gas. She was greatly relieved by bowel movements or the passage of gas and frequently took three or four enemas a day. Prior to admission to the University Hospital she had been placed on an ulcer diet with alkalis, but had not obtained any relief.

There was a low free acidity in the gastric contents aspirated following the test meal. In the roentgenologic examination, a fairly marked prepyloric spasm was noted. No filling defects, however, were observed in the stomach or duodenum. A spastic condition of the colon was the most prominent finding. The patient was instructed to take a smooth colon diet, and tincture of belladonna was prescribed. She has recently reported that she no longer has discomfort and that the bowels are regular.

Case 2 is of interest because of the special study of the epigastric distress.

CASE 2.—H. E., a man, aged 45, admitted to the University Hospital in February, 1929, stated that he had had recurring attacks of abdominal discomfort for from eight to ten years. These attacks appeared at varying intervals and lasted from a few days to several weeks. At first there was distress in the epigastrium and over the lower portion of the abdomen. The distress in the upper part of the abdomen was localized to the right and slightly above the umbilicus and described as a dull, aching sensation. It usually came on from two to three hours after meals and was somewhat relieved by the taking of food. The appendix was removed in 1920. More recently the pain had become more confined to the epigastrium and appeared sooner after eating. He tried sodium bicarbonate, but obtained relief only after belching. During the attacks the stools were either loose or scybalous in character. During the interval of freedom from discomfort, the bowels were regular and the stool formed and normal in size.

A Rehfuss tube was passed and the stomach distended with air. The typical epigastric distress was reproduced. This disappeared when the pressure was released. A tube was inserted into the rectum and the colon inflated. The same upper abdominal discomfort was induced. The patient was then given physostigmine, 1/50 grain (1.3 mg.), hypodermically for the purpose of increasing the peristaltic action of the stomach and the contraction of the colon. After ten minutes the epigastric distress became more severe. The pain was described as sharp shooting in character. Later it appeared at shorter intervals and was of longer duration. Atropine, 1/50 grain, was then administered hypodermically. In ten minutes the pain became less severe and soon disappeared. After the barium enema was given for the roentgenologic examination of the colon, there was discomfort over the lower part of the abdomen and soon a desire to move the bowels. Coincident with the occurrence of the latter sensation, the epigastric pain was felt. In the fluoroscopic examination a marked spasm of the colon was observed. A prepyloric spasm was the most prominent feature in the stomach.

A later fluoroscopic examination was made at which the stomach was examined before and after a retention enema. The motility and the peristalsis were reported by the roentgenologist to be definitely increased after the introduction of the enema. During this examination the epigastric pain was experienced by the patient and the appearance of the distress was coincident with the occurrence of the prepyloric spasm.

The secretory function was studied by the fractional method. There was no free acid throughout the period of observation.

In some patients the epigastric distress was accompanied by nausea and vomiting. The vomiting usually gave complete relief, and, when it did not occur spontaneously, was often induced by the patient. In some, the nausea and vomiting were the outstanding symptoms and directly responsible for the patient coming to the hospital. A gastric retention was at times indicated by the vomiting of large amounts, and the recognition of food taken the previous day. The nausea and vomiting, like the epigastric pain previously described, were associated with bowel symptoms.

The prominence of the nausea and vomiting is illustrated by case 3.

CASE 3.—P. C., a man, aged 24, gave a history of having had attacks of nausea and vomiting for two years. These attacks at first appeared at frequent intervals and were relieved by taking a laxative. More recently, however, the symptoms had

* From the Department of Internal Medicine, State University of Iowa College of Medicine.

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been experienced daily and often followed each meal. They might come immediately after the taking of food, or be delayed an hour or more. Sodium bicarbonate was tried but did not give relief. The patient had been given the Sippy treatment for peptic ulcer, but the symptoms were aggravated.

The free acid was low in each of the samples aspirated at fifteen minute intervals, after the secretory meal. On roentgenologic examination, the stomach was normal except for a prepyloric spasm. There was a spastic condition of the transverse and descending colon. The patient was relieved of his symptoms by treatment of the spastic colon.

In the study of the secretory function of the stomach of patients with the previously described gastric manifestations, the acidity was usually determined by the fractional method. The free acidity was generally low. In some there was no free acid throughout the period of observation. In others, the free acid was low and often absent in the earlier samples. In the latter group there was tendency for the free acid to increase gradually during the later periods of the secretory curve.

Roentgenologic examination of the gastro-intestinal tract showed a spastic condition of the colon as a constant finding. There was frequently some increase in the tonicity and peristaltic action of the stomach. The prepyloric spasm was, however, the outstanding observation. This spasm was variable in its appearance but might be sufficiently persistent to permit registration in two or three successive routine plates. It occasionally interfered with the filling of the duodenal cap, which might appear deformed. The cap was, however, satisfactorily filled by manipulation during the fluoroscopic examination.

COMMENT

A recurring epigastric pain is often associated with a spastic condition of the colon. The discomfort, because of its character, location and relationship to the taking of food, may strikingly resemble that of peptic ulcer. The differentiation is, however, generally possible by a careful detailed history. Even though the distress may disappear for a time after meals, relief is seldom obtained by taking sodium bicarbonate except when the eructation of gas is induced. Furthermore, there are present symptoms referable to the bowel which influence the pain in the epigastrium, even though the latter may dominate the clinical picture.

The type of discomfort under discussion is not limited to a spastic condition of the colon but has been observed in various pathologic states of the bowel, including tuberculosis of the cecum. It would seem that the mechanism of this distress is similar to the epigastric pain seen in patients with appendicitis and that accompanying gallbladder disease. The relief obtained by vomiting, the experimental production of the pain by distention of the stomach with air, the frequent finding of a prepyloric spasm, and the observation of the coincident appearance of the distress and the spasm in one of our patients support the assumption that an increased gastric tension is a significant factor in the production of the pain.

It is generally known that a prepyloric spasm frequently accompanies extragastric lesions such as chronic disease of the gallbladder and appendix. In our experience it is far more common in patients with a spastic colon. Aaron reports the production of a prepyloric spasm by pressure over a diseased appendix. We have on several occasions noted an exaggeration of the spasm by distending the colon. In two instances no barium was seen to pass into the duodenum during the period in which the colon was distended.

The epigastric distress is definitely related to a disturbed function of the colon. It is most prominent when stools are either loose, pencil-like or scybalous in character and usually subsides with an improvement of the bowel condition. The distress is often relieved by bowel movement or the passage of gas. We have repeatedly reproduced this epigastric distress by inflation of the colon. It is to be recalled that it was experienced by one patient following the giving of a barium enema and coincident with the desire to move the bowels. There was at this time, presumably, a great increase in the tension of colon comparable to that induced by the distention with air. It would thus seem that stimulation of the colon is an important factor in the production of the epigastric pain and indicates a reflex connection between the colon and the stomach.

The investigation of the reflex relation between the colon and the stomach has led to varying conclusions. In some recent work, however, which will be described more in detail in a later publication, we have experimentally demonstrated a reflex connection. Dogs anesthetized with barbital were employed in these experiments. The stomach and the ileocecal region were exposed by a median line incision. Warm water was introduced into the stomach and the peristaltic action observed during a control period. Croton oil was then injected into the proximal colon. Within a few minutes the peristaltic activity was decidedly increased and frequently became violent. These gastric manifestations were further intensified by the distention of the colon with air. The same results were obtained when the irritation was limited to the appendix. This induced hyperactivity of the stomach, regardless of the intensity, was immediately abolished by atropine.

In the present clinical study the observations indicate a hypersensitive state of the stomach and colon. No doubt in some the same condition exists in the small intestine. The stomach, colon and possibly the small intestine may thus partake in the production of the clinical picture. The stomach is rendered more sensitive to stimuli and is thus presumably more susceptible to the production of pain, nausea and vomiting. The observations cited indicate that the symptoms are gastric in origin and apparently produced by an increased gastric tension which is intensified by a reflex stimulation from the colon.

ABSTRACT OF DISCUSSION

DR. C. B. WRIGHT, Minneapolis: We all see cases showing upper abdominal symptoms and attribute them to colonic disturbances. I would like to emphasize the fact that the gastric symptoms in these reflex cases will nearly always reveal their true etiology. Pains of colonic origin are frequently associated with nausea. Nausea, as a rule, is not a symptom of gastric disease but is usually associated with conditions outside the stomach. One must be careful that he is not dealing with gallbladder disease. There is a tendency just now among gastro-enterologists to hold the colon responsible for crimes in which it may be only an accomplice, and sometimes only an innocent bystander. One must not overlook the psychoneurotic element in these spastic colons. I often get better results by forgetting the colon and trying to find out what is bothering the patient. The colon once fixed in a neurotic person's mind is hard to forget.

DR. H. B. SWEETSER, JR., Minneapolis: I have been working on this myself for the last five years, and the authors' experiences have matched many of mine. One thing particularly that has impressed me is the inability of the patient either to observe or to describe his symptoms. There are few patients who, when they first talk to one, can tell whether their distress is in the epigastrium or below the navel. If one can teach

these patients to observe their symptoms, then, in checking up, one can arrive at a much more definite history. If one can take the patient personally, when he has this distress, and give him 30 grains (2 Gm.) of magnesium and 30 grains of sodium bicarbonate, repeating the dose in twenty minutes, and twenty minutes later empty the stomach with the tube without finding free acid, and still there is distress, that is an important sign that he does not have an ulcer. If one finds that relief is attributed first to food, and then finds that relief comes from belching, and if one finds that relief is experienced when the patient hears rumbling and gurgling through his abdomen, as well as when he passes gas, all these symptoms point toward a bowel distress rather than to an ulcer. Then if one distends the bowel with gas or with an enema and finds out exactly what happens to the distress the patient is having, one can always get more definite information.

DR. F. A. SPEIK, Los Angeles: I, too, am suspicious of the possibility of a probable ulcer occurring two or three hours after eating. Bowel discomfort usually comes immediately after eating. One way to see whether or not there is bowel discomfort is to give a cold drink. If there is discomfort, the patient will have pain on taking it. These patients are relieved by food, by the escape of gas or even by passing gas through the rectum. The main point is this: A pain coming on soon after eating is bowel pain, and pain coming on two or three hours after eating is most likely caused by ulcers.

DR. ALBERT H. ROWE, Oakland, Calif.: The gastric and colonic symptoms described by the writers should bring the possible presence of food allergy to mind along with the other causes that have been considered. Gastro-intestinal allergy in adults, as in children, is more common than is appreciated. Mucous colitis is not infrequently due to food sensitization and is often associated with gastric symptoms. Both localized and diffuse abdominal pain arising in various sensitized areas of the gastric, intestinal and colonic mucosa, varying from a mild to a severe type, occurs in certain food-sensitive subjects. Last year I called attention to upper abdominal pain simulating that of gallbladder disease which is due to food sensitization and since then Dr. Graham and his collaborators have reported similar pain in patients with negative physical and laboratory observations which was relieved on the basis of food allergy. I feel that one of the reasons the medical profession does not recognize the part that food allergy plays in the etiology of abdominal symptoms lies in the failure to accept the fact that food allergy frequently occurs without skin reactions and usually has to be determined by food trial. For such trial my elimination diets have been of great help.

DR. J. H. FITZGIBBON, Portland, Ore.: The importance of this problem in connection with patients who have been treated for peptic ulcer is great. People who have finished treatment, and some who are under treatment, commonly have colon distress. Not uncommonly it has been discovered that the distress has been brought on by the use of a larger amount of magnesia than is necessary. Many physicians are following the old plan of alternating magnesium oxide, calcium carbonate and sodium bicarbonate. It may take weeks or months before the distress develops. I think it is worth mentioning this, because I have seen a number of individuals whose distress has been cleared up by decreasing or stopping the magnesium oxide. The diagnosis of colonic irritation has been made in a manner similar to that described by Dr. Miller, and relief of symptoms has verified that opinion.

DR. G. H. MILLER, Iowa City: I am glad that the discussion has brought out a number of these additional points, especially that with reference to the necessity for a careful history, covering a long period of time. Some reference was made to that point in our paper, which we were obliged to omit on account of limited time. My feeling is that these symptoms tend to overshadow, to some extent, the bowel symptoms, but not to such a degree as to be misleading if a careful history and a complete study with laboratory work is carried out. The association with the other group of symptoms can always be brought out if one goes back far enough. From the standpoint of this particular study I want to make it clear that this little group of cases which I have referred to is not meant to be illustrative of spastic colitis as a whole, but it is a rather unusual group of cases presenting the special symptoms which we have selected for the purpose of study with reference to pathologic conditions of the colon as a cause of gastric symptoms. Because of the symptoms which they presented they seem especially suited to the clinical study of this problem, which we are also carrying out from an experimental standpoint.

PROGNOSIS IN EYE INJURIES*

JOHN A. DONOVAN, M.D.
BUTTE, MONT.

In the field of medical science there is no other single subject in which the entire public is always as interested as in the prognosis of eye injuries. When a newspaper headline states that some person is likely to lose his eyesight as the result of violence or traumatism, all other news for the moment dwindles into insignificance. By the patient, his friends and the public, the decision of the eye physician is awaited with anxiety, and many an ophthalmologist has wished he were able to give a more definite answer.

Obviously, in the present article, innumerable classifications must be omitted; therefore, only some of the conditions that readily come to mind will be discussed here. The conclusions are drawn entirely from personal observation in a rather extensive work in an industrial center, including coal mines, metal mines, smelters, mills, railroads and other industries in the employ of which I have been for about thirty years. No reference is made here to the opinions of the standard authors, simply because space does not permit giving them the consideration they deserve.

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TYPES OF INJURIES AND THEIR PROGNOSIS

Lightning.—The external burn is similar to other burns. With protective treatment the retinitis usually subsides in time. The removal of the resulting cataracts, done months later, after all deep inflammation subsides, gives good results. One boy, six years after the operation, has regained normal vision with glasses.

Electric Flashes, Strong Lights, Snow Blindness.—After proper treatment there is recovery, as a rule, from these injuries.

Burns.—These usually result in local adhesions and scars, but the prolonged application of heat to the cornea, even by means of the electrocautery, may produce cataract.

Scalds.—These give similar results. Maceration of the anterior of the cornea is likely, but, if it is not too deep, recovery takes place.

Acids and Alkalis.—Fortunately the effects of acids are limited, depending on the quantity of the acid and the severity of the injury. Alkalis are more penetrating and the scars are more common.

Frost.—One man, after a long ride facing a severe storm, had the corneas show signs of being scalded, and he lost the vision in one eye from corneal scars.

Explosives.—Black powder has a rendering effect as an explosive, and the eye effects are local. There may be many carbon particles, mostly aseptic, in the cornea. If too many of them are not removed at one time, the ultimate results are very good. With smoke-

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less gun powders somewhat similar results occur, but the particles may be smaller and more irritating.

High explosives, such as glyceryl trinitrate, dynamite and trinitrotoluene, have a shattering effect. The combustion is more rapid; therefore, only secondary foreign bodies reach the eye. The shattering effect on the lens, iris, vitreous and retina should not be forgotten.

Detonators, such as fulminates, are used in caps to ignite dynamite sticks. These include the very highest explosives; therefore it is well to be guarded in one's prognosis, for a probable later manifestation of detached retina, cataract and such complications, not visible at first, may appear. Innumerable particles of brass are likely to be driven into the eye, some particles penetrating the sclera, iris and lens, and larger pieces penetrating into the posterior part of the globe. In one instance a box of caps exploded in a mine cage. Not one of the three badly injured men at first suspected serious eye trouble, but each of them became blind in one eye some time later from retinal detachment.

Blows.—Such injuries to the eye usually give only temporary trouble, but even small rocks which are thrown may frequently produce traumatic cataract, dislocated lens, torn iris or detached retina. Of course, any or all of these may result from an apparently trifling injury.

Cuts and Other Injuries on the Eyelids.—In my first and only case of cilia entering the eyeball, I was obliged to enter the anterior chamber with forceps and extract three cilia. I thought this unique in the history of eye surgery until I learned of several others who had the same idea. In this case healing was rapid and perfect. The wound in the eyelid was so slight that the eyeball injury was not suspected for several days.

Eyelid injuries, as a rule, have only local effects. Partial paralysis is one of the unfortunate sequels. This followed in one case in which the point of an indelible pencil penetrated the upper eyelid, and it required months to heal in spite of repeated curetting.

Foreign Bodies.—Such material, in and under the conjunctiva, though better out, may remain inert indefinitely. The same is true of the sclera, but brass, iron or metal likely to irritate is dangerous in the sclera. In one instance, before the x-rays were available, a piece of cap remained unsuspected deep in the sclera until local irritation two years later revealed its presence. In the meantime, the eye had become blind and several eminent men had failed to locate the cause.

Though innumerable specks may be embedded in the cornea, the prognosis is usually good, or at least fair, provided there is no serious infection, and provided also that too much irritation is not produced by endeavoring to extract too many specks at any one time, or too frequently. In the iris, as a rule, they are better removed at any reasonable cost, but occasionally they do not appear to do any immediate harm.

A 5 year old boy, in whom the lenses contained many particles of brass caps, had the lenses extracted under ether six days after the accident. Just recently, after twenty-five years, he first experienced the necessity for bifocal lenses for his near work.

Another boy, from whom I extracted the lens of one eye and failed to extract two specks of cap from the anterior capsule of the other lens, now, after eight years, still has very useful vision in that eye also. The particles are now encapsulated, and the rest of the lens is clear.

Small specks of nonmagnetic bodies do sometimes remain in the lens indefinitely without very serious injury.

Much manipulation of an injured lens is often fatal to the eye. In some cases its immediate extraction or, better still, the extraction of the foreign body and about two thirds of the lens matter by suction has a very happy ending.

Foreign bodies in the interior of the eyeball at times remain indefinitely, with only local symptoms or even none at all; but I believe that they must always be considered as focal points for danger, and the patient should be so advised. Naturally, magnetic bodies, and all bodies which may be fairly easily removed, should be taken out. However, the elimination of this only possible danger should not always be secured at too great a cost.

After the extraction of a foreign body, even from the posterior portion of the globe, vision may be good. One man from whose eye a sliver of steel, measuring seven-eighths by three-sixteenths inch, entirely embedded in the eye, was extracted with the magnet twenty years ago, is now a working locomotive engineer, and passes the required visual tests.

Wounds.—Corneal abrasions, if deep, of course leave scars. Several corneas, scratched by finger nails, gave me much trouble. A recent patient had a corneal perforation and a cataract as the result of a finger nail injury. In many lacerated wounds extending clear across the cornea, with prolapsed iris, and even an injured lens, there is complete recovery; in fact, if there is not too much infection, it is astonishing how well an eye, for which one offered no hopes at all, often appears the day after the first dressing. Even the loss of a large amount of vitreous, when replaced by salt solution, sometimes gives surprisingly good results.

I never see a dangerously wounded eye without thinking of a slang phrase of the younger generation, "Ain't Nature wonderful"?

If time confirms our present hopes for acquiring early immunity by the use of foreign proteins in these cases, we may well expect to save at the least a useful cosmetic eye in all but the very badly injured or terribly mutilated eyes.

CONCLUSION

There will never be a time when any man, or group of men, can foretell the possible results in severe eye injuries, but the probabilities are that useful eyes can be obtained in a great majority of cases.

I am not unmindful of that terrible calamity, sympathetic blindness, but I do feel that with improved therapeutic methods and careful observation its possibilities may be more frequently eliminated at not too great a cost. Of course, when infection is imminent, mutilation is beyond repair, the patient's lost time is of vital importance, or other conditions are present in which the eye physician must be the sole judge, immediate enucleation is imperative. When ultraconservatism fails, that most satisfactory operation, enucleation, is always at one's command.

Of course, the public has acquired the opinion that enucleation is of preeminence in surgery. The patient becomes a hero, and the physician is soon forgotten; so, naturally, it may always be the surest and easiest way out for the operator who is unwilling to assume unnecessary responsibility. The saying "Dead men tell no tales" may be paraphrased in ophthalmology to "The enucleated eye relieves all worries."

ABSTRACT OF DISCUSSION

DR. WILLIAM C. BANE, Denver: The percentage of patients with eye injuries varies in different localities, being greatest where there are iron mills, mines, railroad shops and stone cutters. A large percentage of the injuries are trivial in the sense that they are superficial. The prognosis is good in a great percentage of such patients. Corneal abrasions heal quickly if not infected, and the eye is kept closed for nourishment of the cornea. In the small percentage of cases that are troublesome, the trouble is due to local infection, or possibly to an infected tear sac, or diseased teeth or tonsils. The prognosis in surface injuries by burns, as with acids, hot metals and alkalis, varies with the type and extent of the injury. Superficial injuries by stone, coal, twigs and chips of wood are troublesome as they are frequently infected by the pneumococcus, with resulting ulcus serpens. Since the pneumococci are quite readily destroyed by ethylhydrocupreine or quinine hydrochloride, the outlook is not gloomy.

If infection has occurred, it will be in evidence within two or three days following the injury. If infection is suspected in severe injuries, the subconjunctival injection of from 15 to 20 minims (0.9 to 1.2 cc.) of a 1:3,000 solution of mercuric cyanide should be given at once.

Blows on the eye by a blunt instrument, a fist or a ball often injure the choroid and retina; hence the prognosis as to the outcome should be guarded. Concussion by high explosives, as occurred in the World War, produces injuries by what has been termed windage by LaGrange and McKee. This includes a class of cases in which bits of metal striking near the eye caused injury to the coats and in many a choroiditis or chorioretinitis with marked reduction or loss of vision.

Perforating wounds are always serious, as either primary or secondary infection is likely to follow. The prognosis is less favorable in perforating wounds in the posterior division than in the anterior division of the eye. Perforating wounds of the ciliary body are the most serious and are likely to be followed by plastic iridocyclitis in the injured eye and sympathetic inflammation of the fellow eye.

Foreign bodies entering the eye frequently carry bacilli into the eyeball, and if the foreign body is not removed early, the eye is likely to be lost.

The prognosis in cases with magnetizable metal in the eye is made more or less favorable according to the method employed. The foreign body should be withdrawn by the shortest route, and with the least disturbance of the tissues, whether from the anterior or from the posterior segment of the eye.

DR. EDWARD JACKSON, Denver: One point that might easily be overlooked, and which Dr. Donovan mentioned in passing, has often led to the sacrifice of eyes and sometimes even to deviation from the best line of treatment. Dr. Donovan mentioned that, whenever there were large numbers of foreign bodies in the conjunctiva, he removed some of them and left some others, perhaps to remove later, but emphasized that not too many should be removed at once. When one first encounters a case of this kind, the general inclination is to get out every foreign body if it is possible. But I am sure that is a mistake. The first case in which I left some foreign bodies in the cornea was one that I saw twenty-five years afterward, and so could judge the results. In a mine explosion one eye was destroyed, and from the other I removed probably fifty foreign bodies. More than twenty were in the cornea. I did not know what to do except to follow the same line as with foreign bodies in the conjunctiva, taking out a few of the largest, and in the next few days those that seemed to be provoking a reaction. In the end this left quite a proportion of the smaller ones in the cornea. The man had useful vision after twenty-five years, which might have been lost if the remaining eye had been sacrificed in an attempt to remove a large number of foreign bodies when he was first seen.

DR. M. F. WEYMANN, Los Angeles: Carbon particles from powder burns in the cornea or conjunctiva may be nicely removed with the point of a galvanocautery. The carbon is burned and no black mark is left at the site of the injury.

DR. JOHN A. DONOVAN, Butte, Mont.: Although I had come to look on the cautery, combined with other appropriate treatment, as almost infallible for corneal ulcers, when our mines resumed work one time after a prolonged strike not only the eye surgeons but all the other surgeons learned the dangers of even slight infections in very poorly nourished patients. I somewhat dread an infected ulcer that does not immediately improve in a poorly nourished patient, or in any elderly patient with marked focal infection, more especially (surgically speaking) an old "dirty" mouth. I can recall only one man for whom a successful cataract operation was done when the other eye was still perfectly normal, and who never, within my hearing at least, made any complaint. I do recall reading with pleasure the obituary notices of two especially who, whenever they had imbibed too freely, immediately looked me up to tell me they were "seeing things."

MENTAL HYGIENE IN THE COLLEGES *

WINIFRED RICHMOND, PH.D.
Psychologist, St. Elizabeth's Hospital
WASHINGTON, D. C.

In the last several years the mental hygiene movement has found its way into the colleges in various guises, such as lectures on the subject and conferences with the students, and, finally, the psychiatrist himself has come upon the scene. It is not so many years since Dr. Stuart Paton, interested in the problems of students at Princeton, hung out his shingle, so to speak, and invited the troubled souls to conferences with him. They came by the dozen. So far as I know, this was the first attempt at mental hygiene work in any American college. After the war, the psychologic instruments which had been developed for use in the army were tried out in the colleges and there came an era of mental testing, of personality study, and of the development of various tests and rating scales to be used with students. Research bureaus were organized in certain of the colleges for collecting and organizing information concerning the student body. A vast deal of machinery was set up which was entirely new in college life. Problems began to come to light which had heretofore not troubled the horizon of the faculty personnel. After the war the great influx of students into the colleges brought with it problems that had not existed before. Many students were poorly prepared; others had small interest in the curricular activities and came to college for social prestige or because for some reason or other it had become the thing to do. Certain colleges began to see the desirability of gathering together in one file all available information of a psychologic, physiologic, biologic, social or educational nature which could be discovered concerning the individual student. This information when properly interpreted enabled the college to give better advice to the student concerning his educational fitness, his vocational aptitudes and the course which he had best pursue to fit him for future success.

Personnel research bureaus began to be organized in a few colleges about ten years ago. Vassar was one of the leaders in the movement, such a bureau being organized in the fall of 1920. It developed rapidly and showed itself of immense value to the faculty in gaging the fitness of a student for college work and also throwing light on her vocational pathway. In one of her first

* Read before the Section on Nervous and Mental Diseases at the Eightieth Annual Session of the American Medical Association, Portland, Ore., July 11, 1929.

reports, dated May 29, 1922, the director of the personnel research bureau wrote: "With regard to the feasibility of this personality study assisting in the detection of abnormal mental conditions, we feel the work can eventually aid in that direction if amplified." The director found herself called on for help and advice in cases of nervous instability, depression and other types of problems. Other colleges which had organized personnel research bureaus found themselves in similar situations. The departments were called on to straighten out disciplinary tangles and to deal with problems which had not been in mind when the departments were organized. The fact that the majority of the problems which were being uncovered belonged in the field of mental hygiene began to be impressed on a few of the more enlightened members of the college personnel, and various methods were tried out as a means of handling them. The services of a psychiatrist were tentatively employed in a few cases. He had to proceed cautiously because neither the faculty nor the students at first understood just what his function was to be. But in most cases a trial sufficed to show of how great benefit the services of the mental hygienist might be in helping the student to get the most out of college life and to put the most into it. Several colleges claim the honor of being the first to institute a mental hygiene program with the services of a psychiatrist. Dartmouth, Vassar and California were among the first to do so, but by 1927 the movement had progressed so rapidly that at the New England conference on mental hygiene in schools and colleges, held in Boston in the spring of 1927, more than twenty colleges and secondary schools maintaining psychiatric services were represented.

By this time Vassar had employed a consulting psychiatrist for four years and Dean Thompson gave it as her opinion that the work of the psychiatrist had been of inestimable value as an educational guide and as affording assistance to the dean and other administrative officers, and had become an absolute necessity in dealing with the cases of serious mental difficulty which from time to time arose in the college and which the layman could not be expected to understand. In the same address Dean Thompson stated that one of the chief functions of the psychiatrist was the education of the faculty and administrative officers in the principles of mental hygiene so that they could better guide their own lives as well as become able to recognize the signs of mental ill health in the students. The latter also should be instructed in mental hygiene to the end that they might have a fuller understanding of themselves, their possibilities and limitations, and be assured of a greater degree of mental health.

Last fall I made a survey of the colleges and universities which are maintaining some form of mental hygiene service at the present time. Information is available from Elmira College, Brown University, Pembroke, Harvard, Smith College, Bryn Mawr, Vassar, Washburn at Topeka, Kan., Wellesley, University of Minnesota, University of Vermont, Yale, California, West Point and Dartmouth. Although the University of Chicago has the part-time assistance of two psychiatrists, it has no real department as yet and no information of value to give on the subject. Among the others I found different forms of set-up and organization. In some institutions the psychiatrist is a full-time member of the medical staff; in others the mental hygienist is part of the personnel department, while still others lay no emphasis on mental hygiene but pursue it quietly as part of the general health program.

As an example of the work that can be done when there is a regularly organized department I shall take Vassar, where Austin Fox Riggs and his assistant embarked on a full-fledged psychiatric program in 1923. The work was carefully planned by an informal committee consisting of the dean, a physician from the medical department assisted by all the members of that department, and the director of the student personnel department, with the president of the college as an ex-officio member. This committee from the first met with the visiting phychiatrists and discussed with them each prospective patient, and to the constant cooperation of this committee and the faculty the psychiatrists attributed a large share of the success of the mental hygiene program. In the five years since the work began at Vassar, 185 girls and six teachers have been referred to the psychiatrist—a total of one tenth of the student body during that time. This number did not include all who needed assistance, as the advisory committee refrained from sending many girls who did not seem greatly in need of help. Only twenty-nine patients were seen who were not definitely maladjusted, and many of them had minor difficulties which justified the appointment. Forty-four girls were found to be suffering from severe nervous disturbances; thirteen were quite ill with real depressions; four had serious sex difficulties; four had definite suicidal tendencies, and a few were so ill that it was necessary to hospitalize them. The problems presented by the others were simpler but yet of the type that might lead to considerable difficulty if not studied in time. Dr. Riggs and Dr. Terhune, however, are quite optimistic concerning the mental status of the young women in college, believing that there is a lower incidence of abnormal mental conditions than there would be in a group of similar size in the community.

At Yale, the Commonwealth Fund made possible an attack on the general problems of mental hygiene. The department is organized as a part of the department of psychiatry in the medical school and a part of the department of health in the university. There are five resident psychiatrists and a full-time assistant who is a psychiatric social worker. There is excellent cooperation, and many of the students go to the psychiatrist voluntarily. As every one knows, the mental hygiene program is to have a conspicuous place in the new Institute of Human Relations at Yale.

Even at West Point, where the boys are a highly selected group and are in excellent physical health living under ideal hygienic conditions, the psychiatrist found mental upsets occurring with considerable frequency. Dr. Kerns, who was the first psychiatrist at West Point, calls attention to the fact that for many years such things as depressions, phobias and anxiety states were treated by cathartic pills and iodine. The hospital at the military academy had always been a sort of escape for the cadets. They would use it on every possible occasion because it afforded release from the monotony of discipline, drill and class room. He found it comparatively easy to reach the boys with mental hygiene problems.

And so I might go on with all the colleges studied. In all of them practically the same types of problems are found. They may be summarized as:

1. Poor preparation and low intelligence.
2. Emotional maladjustments.
3. Sex difficulties.
4. Actual neuroses and psychoses.
5. Disciplinary problems of one type or another.

In regard to the first, the psychiatrist can do little except to point out the difficulty and advise the student to leave school until he can improve his preparation or find some vocation to which he is better suited than that of college.

The second makes up a large proportion of the problems with which the psychiatrist and the college have to deal. These emotinal maladjustments are of various sorts. There is the student who comes to college from a small high school where he has carried off the honors and finds that he is swamped by numbers and is a nonentity in the college. Such students often develop depressions or become secluded and shut in or so homesick that their work suffers greatly. Then there is the type of student who has never been away from home and is perhaps the petted darling of the father or mother. College is an entirely new environment and there is no one to shield her or to condone her mistakes. This type is perhaps more frequently found in women's colleges, though it is not at all unusual in men's schools. Then there is the girl or boy who is in the throes of a love affair at which we, as their elders, may be inclined to laugh, but which the psychiatrist knows may turn out seriously.

As to actual sex difficulties, they are sometimes not so much abnormalities in themselves as symptoms of personality defects. Many young people are still ignorant of what constitutes sexual normality and are greatly worried over matters which are rather easily cleared up by explanation; others are more serious. Students sometimes become involved in homosexual affairs or in clandestine love affairs which worry them greatly. Aside from the moral lapses which these things mean in our society there is the fear of being found out and the consequent disgrace and punishment at the hands of the college authorities. There is thus engendered a burden of fear and worry, which in some cases causes a complete break. With all of these matters the psychiatrist deals as his training and experience have fitted him to do. The majority of these more or less minor maladjustments occur in healthy young people and are fairly easily handled. Sometimes it is necessary for the student to return for repeated interviews or for the psychiatrist or his assistant to deal with other members of the family or with friends. These cases, however, do not present the stubborn problems that are found in the cases of actual neuroses or psychoses. Students who suffer from a psychosis have, of course, no place in college, although it is amazing how long one can carry on after an actual mental illness has developed. I recall a young man who was definitely hallucinated and was having all sorts of weird delusional experiences for some months before his eccentricities were deemed sufficiently great for him to be dismissed from the campus. The majority of college psychoses seem to be depressions. Much has been heard in the last few years about student suicides. The depression which results from fear or anxiety or which manifests itself in a cyclothymic temperament can usually be invoked to account for these unfortunate affairs. Suicidal trends, or even threats of suicide, which are often merely threats, are nevertheless enough to put the psychiatrist on the qui vive.

As to the neuroses, practically all types known to the psychiatrist are found among college students. It is well known how frequently hysterical reactions occur, and other forms, such as neurasthenia, obsessional neurosis and anxiety states, are found also.

The most difficult type of problem to handle is the disciplinary one, and the psychiatrist usually would prefer not to attack it. Sometimes the problem is as much that of the faculty or the college rules as it is that of the student, but there is a certain type of personality found in colleges as well as elsewhere that is not amenable to discipline. This personality often proves also unamenable to the psychiatric approach. On the other hand, the problems of discipline are sometimes readily cleared up when given a good airing in the mental hygiene office.

However, interviews with students are only a part of the mental hygiene program in the college. Probably the more important part is that of educating both faculty and students to an understanding of mental hygiene and an appreciation of its value in their own lives. Indeed, the problem of "selling" mental hygiene to the faculty is one of the most difficult things that the psychiatric department must do. In many instances, faculty members are indifferent or even hostile to the mental hygiene movement. Nearly all of the colleges referred to name the attitude of the faculty as the greatest hindrance to the success of the program. However, as time goes on and the faculty members have an opportunity to see the actual value of the psychiatric approach, these difficulties become less. In the institutions in which the psychiatric department has been longest established, the faculty has almost invariably become enthusiastic and cooperative. Lectures and conferences with the students serve to help them to an understanding of their difficulties and point the way to a better adjustment, so that the student not only is able to seek help when he needs it but often becomes able to help himself.

There has been considerable criticism in some quarters of the introduction of mental hygiene into the colleges on the ground that it is likely to make the student morbid and introspective. Others fear that the psychiatrist may be a freudian who will lay undue emphasis on sex or advocate the abolition of restraints and repressions and thus present new problems to the college authorities. These things do not seem to have happened in the colleges where the mental hygiene program has been tried. The fact that it was not enthusiastically received at first and that it has had to make its way in the face of considerable suspicion and opposition has prompted its sponsors to go slowly and to take precautions against wrong moves. The men and women who have gone into psychiatry in the colleges have been of the highest type, many of them outstanding figures in the profession, and it is to their vision and their wisdom that we owe the success that has been achieved.

Having taught a course in mental hygiene in George Washington University for five years, I feel entitled to an opinion on the subject, biased though it may be. The number of problems uncovered by such a simple and elementary course is worth thinking about. After a few weeks of the term, students were constantly asking for conferences about all sorts of personal problems. Some of them were serious, such as that of a young woman who was contemplating suicide, and of another girl, who actually developed a psychosis within a year. The great majority were minor maladjustments, yet the source of great unhappiness or anxiety to their possessors. Unhappy home conditions, infantile attachments, paranoid trends, fears and phobies, inability to study, sex difficulties, are among

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the thousand and one troubles that beset the adolescent and which he may muddle through without help, but which all too often continue in an exaggerated form into adult life. How much benefit these young people actually received from the course it is impossible to say, except in a few cases in which the student was helped in a social adjustment that could be observed objectively.

It would seem that the mental hygiene program in the college has been in existence long enough to have proved its value. If it does no more than aid the student in his college adjustments and enable him to do his work better and to get on more happily with his associates, it would seem to be justified. Some of us believe it will do more than this: that the student who has grasped its principles and is minded to put them into practice will be a better adjusted, happier and more socially useful individual than, in the majority of cases, he would have been otherwise.

ABSTRACT OF DISCUSSION

DR. FRANKWOOD E. WILLIAMS, New York: I have had some experience with college mental hygiene, both in observing the work done in various universities and also as one of the advisers at Yale. At Yale we have tried to work quietly, not coming into the university with banging of drums and a great announcement as to what we were going to do. We tried to establish ourselves in the health department and then let ourselves be judged by the product we produced. We have tried a new plan in reaching students. Heretofore, the students were referred to us by deans or by committees or by members of the faculty or by other men in the health department, or they came of their own accord. This year we tried the scheme that was used successfully in the army. All of the men entering Yale are given a physical examination whether they are freshmen or postgraduate students. The usual army method is employed. We attached a psychiatrist to the end of the line who has merely a few minutes' conversation with the individual but in those few minutes tries to size up his possibilities and then either lets him go or makes an appointment with him for a second visit. We have found this very productive in getting us quickly in touch with new men in the universities who were in need of assistance. The number of men who were picked out of line for the second interview varied from day to day, and varied with the men who were examined on that particular day, but sometimes the number picked out for a second interview was as high as five and six out of ten individuals. This does not mean that there were serious problems involved, but there was something suspicious. I cannot recall offhand how many men after seeing the psychiatrist the second time were continued under treatment. I think it was something like 50 per cent. This brought us in touch early in September and October with those students who were coming to the university and who were likely to have difficulty during the year, who were sure to have difficulty, or who were having it at the present time. We probably would not have seen them until months later, after something had happened, unless we had used some such system as this. It was highly successful and I think they plan to go on with it next year.

DR. FRANKLIN G. EBAUGH, Denver: I dislike very much the tendency prevalent in many universities of referring problems in transition or even minor problems to the psychiatrist in the sense of using the psychiatrist as a sort of executioner. I dislike very much using the psychiatrist as a mop. The success of this organization, as explained by Dr. Richmond, indicates that every college needs a definite mental hygiene organization to take care of its needs.

DR. WINIFRED RICHMOND, Washington, D. C.: Dr. Williams has given us a glimpse of some of the things that can be done, some of the methods and ways of working the situation out. Information may be found in articles by physicians published in *Mental Hygiene*.

SOME PRACTICAL ASPECTS OF THE SEXUAL ADJUSTMENTS OF CHILDREN *

JAMES S. PLANT, M.D.
Director, Essex County Juvenile Clinic
NEWARK, N. J.

There has recently been, for various reasons, a marked access of interest in the question of sexual adjustments. So much has been done by way of showing a relationship between the sexual problems common to us all and the various phenomena of social maladjustment that a number of theories as to human thought and conduct have naturally developed which have the sexual drives as their bases. Indeed, one gets the impression that the psychiatrist is interested in no other matter. These various modifications of the psychoanalytic theory contain assumptions that are in no sense proved at the present time. Even if this proof could be adduced within a reasonably short time, the theories involve a therapy beyond the reach of the general practitioner, and even of many specialists. This has given rise to a thoroughly unscientific and probably unsafe procedure in which many employ "a little of the psychoanalytic technic" dressing up their practice with some high sounding terms, doing a half-way job that probably harms more than helps the patient. In all this problem of sexual adjustment the medical profession is thus giving little constructive help.

Moreover, this problem of sexual adjustment is today of tremendous social and individual importance. Whether we are just awakening to a matter of long standing or whether modern culture has intensified our sexual interests cannot be answered here. I shall merely say in passing that, admitting a general willingness to discuss matters previously banned, there has yet occurred a growing automatization of work and stratification of industrial opportunity such as would tend to place a premium on the emotional satisfactions derived from the physical sexual life.

The fact remains, whatever its sources, that the general practitioner can give little assistance in a basic and pressing community and individual problem. For the problems of masturbation, of homosexual perversion, of exhibitionism, of the various obviously compensatory cravings, he has little to offer beyond the panic-stricken nostrum that the patient "get married."

Obviously the subject is beyond the limit of this short paper and any impression of a sweeping clearance of all the questions involved is false. I have covered a wide field, feeling that a statement of relationships is more accurate than the depiction of meticulous and therefore distorted details.

Schematically, the child's sexual interests and development may be divided into three periods. First is a "family" period extending from birth to the child's first real socialization or, roughly, to his first schooling. Conditions within the family often, of course, markedly shorten or lengthen this period. It is the period of establishing the physical and many of the mental habits.

Two types of sexual problems bring these children to one's office. The first is what most adults are pleased to call "masturbation," referring to the child's rather ruminant habit of rubbing the genitalia. If, as we should, we reserve the term "masturbation" for

* Read before the Section on Nervous and Mental Diseases at the Eightieth Annual Session of the American Medical Association, Portland, Ore., July 11, 1929.

the onanistic sexual acts that increase in intensity up to a sort of orgasm, then this habit is rare among young children and in my experience is largely induced precisely by the parents' and physician's anxiety over the innocuous, ruminant type of activity. Parents particularly should be made to realize that this habit does not have sexual implications in any adult sense. The origin of the habit is the same as the origin of the habit of investigating any other part of the body. Its persistence and accentuation are dependent on parental anxiety, social tabu and, less often, local irritation. The therapy is the same as for any other habit—complete failure to notice the bad habit, mild rewards for the days it is not indulged in and a certain, but apparently casual, examination for local irritation. By all odds the biggest factor is that of parental reassurance. (Parenthetically I may say for all of us that the moment we cease to interpolate adult implications into juvenile activities we will take a long step forward). Circumcision is often valuable in these cases, but only as a part of the general treatment. Through pain it largely suffices to stop the habit during the period that the parents are adjusting themselves to the newer attitude. Those cases of true masturbation in young children which I have seen have always been in families of outstanding unhappiness and maladjustment. They can be readily treated by directing the major part of the therapy to the total family problem. I have had none of the latter cases long enough to know what the adolescent sexual adjustments might be.

The second type of sexual problem concerns the many and frequently embarrassing questions as to adult sexual adjustments. Here, again, the predominant factor is the false interpolation of adult concepts into the child's questions. Unfortunately, adults have been beleaguered with the notion that the child must be told nothing but the truth. This means halting and disturbed answers to commonplace questions, which thus means that the child develops false attitudes. Freedom of discussion and complete avoidance of the feeling that these matters are shameful or dirty or sinful are far more important than the temporary learning of a few paltry so-called facts. The advocates of "complete" sexual education for young children forget that all such facts must be relearned with new implications at adolescence.

There follows in the child's life a "social" period, extending essentially to adolescence, at which time sexual acts of themselves first give "primary" and satisfying emotional returns. The "social" period represents the child's adjustment to others of his own age outside the family.

The sexual problems of this age are those of "dirty" words, homosexual and heterosexual acts of investigation and the child's whole adjustment to a world of phenomena which has by this time been presented as definitely immoral and sinful. To these various acts of sexual interest and curiosity there is now much more force and meaning than obtained earlier. However, here again the drive is largely from the interest existing in anything that is hidden and under a social ban. At this stage the therapy lies peculiarly in the physician's hands. In all the field of medicine there is nothing more startling than the immediate "desensitization" of these "dirty" words and acts when the child first learns that they may be discussed without moral implications. At this period accusations should never be made; threats and dire prognostications are to be absolutely avoided. A half-four of free discussion in which one willingly but not overzealously uses the child's own terminology rapidly removes the fundamental source of difficulty and is abundantly repaid in the patient's later happiness and adjustment to the whole sexual sphere. As before, evidently much must be done with the parents by way of having them, too, recognize the folly of stressing the "immorality" of one of life's basic adjustments. While this parental education is extremely important as a background, I am quite convinced that the person to help the child in his first adjustment should be a third person—an outsider—rather than either parent. It is extremely difficult for the child to go with his experiences of the street to those who so consistently and pervasively share their lives with him.

At any time from 11 on begins a third period in the child's sexual problems—adolescence. With due recognition of its wide-flung problems, it is of interest here only in the sense that it represents the first time in the average child's life that the various physical sexual activities are of themselves and primarily satisfying.

It is largely this fact that brings problems to the physician. With the marked physical and emotional changes that characterize this period, it is only to be expected that the child should make the same thoroughgoing investigations as to what is happening as he is urged to make of everything else in life. Parents urge the physician at every turn to make of this period an understandable, controllable affair. Adolescence has never been that—and I doubt whether such marked changes could ever occur in the human being without the accompaniment of tremendous emotional stress.

More particularly, one here deals largely with problems of masturbation, homosexual perversions, exhibitionism and active pursuit of the opposite sex with, at times, physical violence. In addition there are a few bizarre phenomena which unfortunately through the press gain undue notoriety. It is perhaps the weird "explanations" given in the latter cases which have, as much as anything, deterred the average practitioner from giving the help he can and should give in all this perplexing problem.

Here again an understanding approach to the child is a real necessity and a venture yielding magnificent returns. The child should never be directly "accused" of, let us say, masturbation. This only serves the more surely to prove to him that this dirty, sinful act is proclaimed by his eyes, his speech, his gait or what not. On the other hand, the child is more than willing to tell of the first bad gangs from whom he heard about girls, the boys who talked about doing things to oneself and his decision to find out what it was all about. That is, one relives, in summarized fashion, the child's life with him and he gives his confidence to one who has come into the problem precisely through the same steps which he himself lived and which at the time seemed so reasonable. The diagnosis can be made only in this genetic way—and is the method to be employed whatever act is suspected or known.

The therapy must always be to consider the act as a symptom and as not important in itself. Realizing that the ages from 15 to 21 represent, perhaps particularly in boys, the greatest access of sexual hunger and that our cultural development rarely allows for that time a satisfaction that is "legal" or "moral," it seems trite to say that there must be a vast number of these disturbing compensatory activities which are not of the slightest prognostic importance. The therapy is as,

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varied as the patients. Often the presence in the physician of a disinterested person to whom the child may go with his problems in itself brings marked easement. Fear should never be used in dealing with these matters. Athletic exercise sometimes serves only to accentuate the sexual hunger. In my experience the child who is happily adjusted in school and at home does not find his sexual adjustment a pressing problem. Thus frequently the therapy is a matter of general social adjustment.

In the prognosis, the phantasy accompanying the act is of transcending importance. In my experience no matter how perverted the act itself, if the phantasy is heterosexual (that is, if a boy "pretends he's doing it to a girl"), the outlook is good. Those children with homosexual phantasy during the act or with little or no phantasy represent serious and complicated situations and should be seen by a specialist if possible. I repeat that this is true regardless of the character of the actual act which brought the child to the attention of the parents or the court.

Finally, I will repeat just one part of my paper. Parents know no more about their sexual life than they do about, let us say, electricity. Yet for this one subject they are coaxed, cajoled, threatened and browbeaten into giving an explanation which the youngster cannot understand. Perhaps in no other subject are the facts themselves less important, and in no other subject is the attitude of free discussion, from earliest childhood, with an absence of repressive or "immoral" or "dirty" implications, more important.

502 High Street.

ABSTRACT OF DISCUSSION

DR. CHRISTIAN J. ROHWER, Seattle: I should like to emphasize that frequently the attitude of parent or teacher is more harmful than the act itself. For instance, all mental hygienists have had experience with masturbation. An 11 year old girl was referred to me because of this practice. There were no signs or evidences of local irritation. The patient told about the circumstances under which the habit had started. The attitude of the foster mother, who had been in the home since the child was 6 years old, was far from what it should have been. The treatment consisted in having a frank discussion with the foster father and mother about the problem. This girl had been treated prior to being referred to me by having had some boxing glove arrangement made which was locked about her wrist each evening at bed time to prevent her from touching herself, a very unsound and unpsychologic form of therapy. The second step in the treatment was to advise the parents to discontinue the use of that method. I have seen this child from time to time and the habit is lessening. There is no longer the emotional attitude of guilt or inferiority about the act which was a prominent feature. The foster mother no longer asks the girl each morning, "How often did you do it?" and so forth. I am sure the outlook in this patient's adjustment is going to be satisfactory. The three phases of sexual development mentioned by Dr. Plant should be borne in mind as they help us much in understanding and approaching these problems. When these phases are understood by the examiner one immediately knows how to deal with the situation and the adjustment can be brought about by logical and unemotional methods. The child's own story has considerable significance and it is surprising what information can be obtained when the young patient is given an opportunity of telling some one who understands about his trouble. By using their own vernacular it is interesting to see how children will "open up," so to speak. Until the mental hygiene form of approach has been made, these problem children have had the greatest hesitancy in divulging their feelings about themselves because the only attitude they have ever known is one of "sin," "insanity," or "shame," which is invariably the attitude toward masturbation. The mental hygiene movement is a scientific attempt to handle behavior problems in such a way as to prevent the later adult crimes and mental breakdowns and to bring about a happier and healthier mental attitude toward life in general.

DR. THEODORE DILLER, Pittsburgh: I should like to introduce an old friend of mine into the discussion. He is Ptah Hotep, who lived in Thebes about 4,000 years before Christ. One of the wisest of his sayings is this: "The archer hitteth the target partly by pulling and partly by letting go; and the boatman reacheth the landing partly by pulling and partly by letting go." I have thought of that a great many times. I think it would apply to this subject of teaching sex hygiene. I think the goal will be obtained by instruction, by letting go at the proper time and then by more instruction at the right time. Like all the rest of us, I have read many discussions on this subject of sex hygiene for children, and I gather the impression that many advocate the view that one may talk about this subject at any time and that one cannot talk too often to the child or to the parent. I believe thoroughly in instruction but I do believe that a great deal of harm may be done by talking of it too frequently and at the wrong time. I think there is a great danger in that and one that should be avoided. Having introduced one great philosopher, I wish to terminate my remarks by quoting another great philosopher and psychologist, perhaps as great a psychologist even as William James, the greatest this country has yet produced—Benjamin Franklin. He said that we may talk too much on the best of subjects.

DR. RAY JONES, Seattle: Neurologists have been assuming that about 100 per cent of men have practiced masturbation at some time, and it is given entirely too much prominence. If we could get as much information concerning women we might find that our percentage was less than that. If we will use a little common sense and handle children with common sense, the Lord will take care of this masturbation problem.

DR. JAMES S. PLANT, Newark, N. J.: I, too, desire acutely a common sense approach to this subject. I see many children sent by general practitioners, and even specialists, in whom not a grain of common sense has been used about this one particular subject. We all certainly realize the uncalled-for amount of accusation and moralizing that physicians employ in this matter of sex adjustments. The problem of masturbation was considered solely because it is among the more frequent of the sexual problems. What I have had to say is quite as applicable to the problems of sodomy or exhibitionism. As to Dr. Diller's remarks, I think we all understand his point of view. Nothing is more disgusting than to see a family or a physician glory in all the "orrible details" of this matter of sex adjustment. But there is this paradoxic point that I want to bring out: Just the minute that this subject is a subject that we are willing to talk about at any time, we won't talk about it any more. It is largely the fact that sexual discussions disturb us that eggs the youngster on to overweaning interest and questions.

Vincent's Angina.—This mouth disorder often is an extremely severe one, so severe that it may result in the death of the patient. Whether the Vincent's organisms and the associated spirilla are responsible for the systemic infection is an open question. It may be that the secondary infection that occurs is responsible for the occasional severe toxemia and death in some of the severely poisoned individuals. I have seen patients come to autopsy in whom mouth lesions, however, were the only definite findings to which the death of the patient could be attributed. In the angina of Vincent we have noted some rather remarkable blood findings, findings which would tend to confirm the supposition that a severe toxin reaction is not necessarily due to septic organisms. We now have quite a series of cases in which a leukopenia was present with relative and absolute decreased polymorphonuclears and with a relative and sometimes an absolute increase in small mononuclears. The treatment of Vincent's angina seems to be more or less standardized. However, with our patients we have found that hydrogen peroxide as a mouth wash, followed by hourly irrigations of 1 to 500 potassium permanganate, seems to work more satisfactorily than any other treatment, including arsphenamine intravenously.—Musser, J. H.: Mouth Infections in Relation to Systemic Disease, *California & West. Med.*, September, 1929.

REGIONAL ANESTHESIA IN UROLOGY *

CLARK M. JOHNSON M.D.
SAN FRANCISCO

Regional anesthesia, though widely adopted and advocated for many surgical procedures, seems particularly adapted to urologic surgery. This is most fortunate because many urologic patients are poor surgical risks, especially the aged with hypertrophy of the prostate and those debilitated from sepsis. Some type of regional anesthesia has been employed in more than 300 urologic cases in Dr. Frank Hinman's service at the University of California Hospital during the past three years, at first only when it seemed especially indicated but more recently in a higher percentage of cases from choice. Nothing radically new has been attempted, but the results have been so satisfactory that it seems worth while to discuss them briefly.

Three types of anesthesia have been employed: (1) simple caudal block, (2) caudal plus transsacral and (3) spinal, depending on the surgical procedure to be undertaken. The technic employed has been that of Dr. Gaston Labat,[1] who I believe has done more than any one else to popularize regional anesthesia through his excellent teaching of the sound and practical principles involved. His methods and instrumentarium are too well known to warrant repetition.

RESULTS

Simple caudal block has been employed 150 times, from 25 to 35 cc. of 2 per cent procaine hydrochloride being used, depending on the weight and age of the patient. It has been useful for cystoscopies in tuberculous patients, when any instrumentation is painful, and in patients extremely susceptible to pain. Since the anesthesia lasts an hour and a half it was employed for fulgurations of large vesical tumors or ulcers, for litholapaxy, removal of the median bar by Young's punch or Collings' method, and for implantation of radium in the prostate or bladder. It has also been employed for dilating painful strictures, internal and external urethrotomy, and minor operations on the perineum, female urethra and vagina. There have been no frank failures; some patients have said they could "feel a little," but none ever required any additional anesthesia. The operator should be careful not to overdistend the bladder when doing cystoscopic work under caudal anesthesia, as this is painful regardless of how perfect the injection may have been.

TABLE 1.—*Caudal Block*

Type of Operation	Number of Cases	Partial Failures	Complete Failures Requiring Other Anesthesia	Severe Reactions
Cystoscopy	75	2	0	1
Fulguration	30	2	0	1
Radium	12	0	0	..
Median bar	15	1	0	..
Litholapaxy	4	0	0	..
Strictures	6	0	0	..
External urethrotomy	2	0	0	..
Perineal abscess	3	0	0	..
Caruncle	3	0	0	..
Total	150	5	0	2

Caudal anesthesia plus transsacral block, that is, injection of the sacral canal and the first, second and third sacral foramina, was employed 120 times. One per cent procaine hydrochloride was used and 30 cc. injected into the sacral hiatus and 10, 8 and 6 cc. in the first, second and third sacral foramina, respectively. This was done 118 times for perineal prostatectomy and twice for seminal vesiculectomy. I have had only one real failure and that after 100 successful operations. Two patients with cancer and one seminal vesiculectomy requiring considerable manipulation were finished under gas and oxygen.

TABLE 2.—*Transsacral and Caudal Block*

Operation	Number of Cases	Partial Failures Requiring Gas to Finish	Complete Failures	Severe Reactions
Perineal prostatectomy	108	0	1	2
Perineal prostatectomy (cancer)	10	2	0	0
Seminal vesiculectomy	2	1	0	0
Total	120	3	1	2

Fifty patients have been given spinal anesthesia. There were two failures. It was done chiefly for perineal prostatectomy (cancer), suprapubic cystotomy and nephrectomy. The importance of the use of spinal in conjunction with gas and oxygen anesthesia in difficult surgical procedures in the lower portion of the abdomen and ureters has not been sufficiently stressed. Bilateral calculi in the lower ureters can be removed through a midline incision in nearly half the time required under gas alone because of the relaxation and dry operative field. Spinal anesthesia along with gas is nearly indispensable in transplantation of the ureters either to the bowel or to the bladder. The postoperative shock and vomiting are notably less.

PREPARATION OF PATIENTS AND REACTIONS

For simple caudal block, no preparation is necessary. Patients may have breakfast if desired and plenty of fluids. This is a great help for cystoscopic work when it is desirable to have the kidneys functioning normally. A preliminary narcotic is sometimes advisable but not necessary. When the caudal anesthesia is to be supplemented with injection of the first three sacral nerves preliminary to major surgery, a little more care is required. Food should be withheld, but fluids may be given freely up to the time of operation. Morphine alone or combined with atropine should precede the anesthetic by fifteen minutes. Large doses of morphine should not be given to the aged or debilitated; ⅙ grain (0.01 Gm.) is usually enough. Much of the depression attributed to the anesthetic may be due to the morphine. Scopolamine has proved a dangerous drug because of its uncertainty of action and the frequent individual idiosyncrasy encountered. Before discarding it I have seen patients become either stuporous or maniacal following anesthesia. These reactions have not been observed since its use was discontinued. Except as just mentioned, I have never encountered any serious reactions in a total of 270 caudal and caudal plus transsacral blocks. There have been no deaths attributable to the anesthesia in any way and there has been no local infection or sloughing. A drop in blood pressure to 90 or 100 is occasionally encountered, with pallor, sweating and dizziness. Slight nausea for five or ten minutes is fairly common. Vomiting is extremely rare.

Recently I have been using ephedrine, 0.05 Gm. hypodermically, one-half hour before giving the anesthesia, as has been used so successfully with spinal anesthesia. I believe it will entirely remove the element of fear

* From the Department of Urology, University of California Medical School.

* Read before the Section on Urology at the Eighteth Annual Session of the American Medical Association, Portland, Ore., July 12, 1929.

1. Labat, Gaston: Regional Anesthesia: Its Technic and Clinical Application, ed. 2, Philadelphia, W. B. Saunders Company, 1928.

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experienced by those not familiar with local anesthesia by doing away with the reactions caused by the fall in blood pressure. As an illustration, a man with a pressure of 250 was given ephedrine (0.05 Gm.) and then a caudal block of 35 cc. of 2 per cent procaine. The pressure rose to 255, then fell to 245 and stayed there. He did not have any symptoms whatever. From previous experience, I think his pressure would have dropped about 80 or 100 mm. without the ephedrine.

Several other factors have been observed to be important in preventing reaction during and after caudal and transsacral block. 1. The solution used should be freshly prepared and preferably dissolved in a physiologic solution of sodium chloride. If the operator prepares the solution himself, using the sterile capsules of the powdered drug, he is sure of its purity and strength. 2. All manipulations should be gentle and deliberate, only thin, sharp needles being used. If blood vessels are encountered, the injection should cease until no blood can be aspirated into the syringe. 3. The patient's face should always be visible to the operator; by careful observation he can easily tell the condition of his patient without having some one present to keep checking the blood pressure. Severe pallor and sweating or drowsiness should warn the operator to cease his injection temporarily, though this is rarely necessary. 4. More than 35 cc. of 2 per cent or 100 cc. of 1 per cent procaine should never be used. Less should be used, depending on the weight and general condition of the patient. The resultant anesthesia depends not on how much is used but on how accurately it is placed. 5. The patient's head should be kept lowered after caudal as well as spinal anesthesia.

Following spinal anesthesia, slightly more severe reactions were noted, but were alarming only on one occasion when through error the patient's head was elevated and respirations ceased. The patient was put in the extreme Trendelenburg position at once and his respirations began almost immediately and he did not suffer any ill effects. Labat [2] especially has stressed the importance of the Trendelenburg position immediately and for three or four hours after spinal anesthesia, and I am sure this is most important. Even

TABLE 3.—*Spinal Anesthesia Alone*

Operation	Number of Cases	Failures	Severe Reactions
Prostatectomy, perineal	11	0	0
Prostatectomy, suprapubic	4	0	1
Nephrectomy	6	1	1
Seminal vesiculectomy	1	0	0
Cystotomy	10	1	1
Stone in ureter	2	0	0
Epididymectomy	2	0	0
Hydrocele	2	0	0
Total	38	2	3

since the advent of ephedrine, which certainly maintains the blood pressure, it is unsafe to elevate the patient's head. This is also important in the prevention of headache, which in this small series has been nil.

DISADVANTAGES OF REGIONAL ANESTHESIA

Regardless of the favorable results of regional anesthesia as we may see them, it is not a success unless it is satisfactory from the patient's standpoint. Great care should be exercised in seeing that the patient is as comfortable as possible during the injection. A nearly painless injection can be given if wheals are raised in the skin with small, sharp needles and the periosteum is approached gently. The preliminary hypodermic relieves a great deal of the apprehension and nervousness. The public is becoming more accustomed to so-called local anesthesia and few will refuse it if properly approached. It is a grave error to proceed with any operation if the patient complains of pain. A light gas anesthesia is all that is needed and should always be given immediately. One disadvantage of caudal

TABLE 4.—*Spinal Anesthesia with Gas and Oxygen*

Operation	Number of Cases	Failures	Severe Reactions
Stone in one or both lower ureters	3	0	0
Transplantation of ureters	6	0	1
Repair of vesicovaginal fistula	3	0	0
Total	12	0	1

block (even more so of spinal) should be borne in mind: The relaxation of the vesical sphincters caused by the anesthetic may confuse the cystoscopist if an accurate study is to be made of the posterior urethra and bladder neck.

ADVANTAGES OF CAUDAL, TRANSSACRAL AND SPINAL ANESTHESIA

For all cystoscopic procedures in which more than a local urethral anesthesia is needed, I believe that caudal block excels all other methods. Its advantages are multiple. It gives practically 100 per cent perfect anesthesia for any cystoscopic manipulations and lasts an hour and a half. It can be repeated many times at frequent intervals if necessary. The patient is able to cooperate throughout. There is no suppression of renal function as a result of lack of fluids or vomiting, there is no serious reaction and there are no sequelae.

For perineal prostatectomies, transsacral and caudal block seems slightly less dangerous than spinal anesthesia, though the latter has many advocates. I believe that the added safety and less severe reactions of the former make it more desirable for general use. Shaw [3] and Berry [4] use 3 per cent procaine, 20 cc., and do only the caudal block for perineal prostatectomies. This is much simpler; but during the twenty minutes it takes for this anesthesia to become effective the sacral nerves can be injected. Their percentage of failures is greater and it seems to cause as much reaction as the more complete block.

At present I reserve spinal anesthesia for use in conjunction with gas for work on the lower ureters and lower portion of the abdomen, for nephrectomies in poor risks and for cystotomy or suprapubic prostatectomy. I believe, however, that every one will be using more spinal anesthesias as the medical profession and public gain confidence in the procedure. The future of spinal and the other forms of regional anesthesia depends to a large extent on the training of more anesthetists who are capable of giving any or all of the forms of general and regional anesthesia. Surgeons have been the first to take it up in most localities, but it is ideally an anesthetist's job to work with the surgeon and advise in selecting the type of anesthesia to be used, admin-

2. Labat, Gaston: Elimination of Dangers of Spinal Anesthesia, Am. J. Surg. **5**: 625-632 (Dec.) 1928.

3. Shaw, E. C.: Epidural Anesthesia for Perineal Prostatectomy: An Experimental and Clinical Study with Report of One Hundred Consecutive Cases, J. Urology **15**: 219-265 (March) 1926.

4. Berry, G. P.: Caudal Epidural Anesthesia in Perineal Surgery of the Genito-Urinary Tract: A Report of One Hundred and Sixty-Five Consecutive Cases, J. A. M. A. **90**: 1018-1021 (March 31) 1928.

ister it and see the patient through the operation and back to his room. It is only a natural division of labor and responsibility from which the patient and the surgeon should both profit.

SUMMARY AND CONCLUSIONS

Caudal anesthesia has been successful and without serious reaction in 150 instances and is recommended for all painful cystoscopic procedures in which more than local urethral anesthesia is needed. Caudal anesthesia plus injection of the first three sacral nerves was used for 118 perineal prostatectomies, with one complete failure and two other patients finished under light gas and oxygen. Ephedrine is suggested as a valuable drug which seems destined practically to eliminate even the mild reaction from these procedures. Spinal anesthesia has been found especially valuable as an adjunct to gas and oxygen for intra-abdominal surgery of the lower genito-urinary tract. Regional and spinal anesthesia will spread in popularity in proportion to the number of well trained anesthetists who are equipped to give anesthetics in its now broadened field.

LATER RESULTS OF SURGERY OF THE SEMINAL VESICLES

REPORT OF ONE HUNDRED CONSECUTIVE SEMINAL VESICULECTOMIES *

ROBERT GUTIERREZ, M.D.
NEW YORK

Surgery of the seminal vesicles has maintained an unusual interest among the medical profession for the last half century. This interest depends, first, on the rôle that has been attributed to pathologic changes in this viscus, with regard not only to new methods of diagnosis and treatment but also to the theory of foci of infection in the pathogenesis of certain systemic diseases of unrecognized etiology; and, secondly, on the deep position in the pelvis of this organ, lying as it does underneath the peritoneum between the bladder and the rectum, and occupying the intervesicular fascial space that is covered by Denonvilliers' aponeurosis, which has made any surgical approach most difficult and has been the cause of much dispute in operative procedure.

During the year 1923-1924 I performed a long series of operations on the seminal vesicles in insane patients, for the purpose of drainage and excision, in an effort to eliminate foci of infection. The work was carried out at the New Jersey State Hospital under the guidance of its medical director, Dr. H. A. Cotton, and in collaboration with the medical staff. The insane patients in that institution are submitted as a routine to a complete clinical study with a view to correct diagnosis and elimination of all possible foci of infection as the etiologic factors underlying functional psychoses or toxic infection of the nervous system.[1] After the patients are submitted to thorough clinical examination in a survey for correct diagnosis, infected teeth and tonsils are removed, sinus infections are drained, and, finally, complete serologic and bacteriologic tests are made. Genito-urinary examinations are then made, and when the vesicles or prostate are found to be diseased in any way, the patients are operated on for the purpose of detoxication, thus removing all possible foci of infection. The combined results of treatments obtained in a group of cases were most striking and the statistics of the hospital published in the decade previous to 1918 showed the recovery rate to be only 37 per cent; and since these detoxication treatments have been instituted the proportion has reached about 77 per cent, showing the beneficial results obtained with this method of treatment.

Smith and Morrissey,[2] in a preliminary report published in 1922, summarized in five groups the vesicular infections requiring operative treatment: (1) the inflammatory group, comprising those presenting acute suppurative symptoms of both the vesicles and the prostate, as is commonly seen in the abscess type or in tuberculosis of the seminal tract; (2) the rheumatic group, including those with arthritic manifestations dependent on a local infection; (3) the pain group, which covered the cases presenting perineal pain and suprapubic or inguinal pain, slight urinary symptoms, rectal symptoms and unclassified sexual symptoms such as painful erection, bloody emissions, painful intercourse, weakness and sometimes impotence; (4) the neurasthenic group with moderate physical symptoms of disease in the vesicles, or so-called sexual neurasthenia, and (5) the psychotic patients with the graver forms of mental disorders, with pathologic and chronically inflamed and much distended vesicles revealed on routine examination.

To the last group the experimental work here described is confined, a report being made on the operative experience gained and the surgical results obtained in a series of 100 consecutive seminal vesiculectomies. Attention is given to the preoperative and postoperative care of these patients and to the improved technic employed, and especial emphasis is placed on the fact that, although only a few patients have had the benefit of complete recovery, no death or serious complication has ever occurred in this long series of operations.

At the same time it is my purpose to discuss briefly the later functional results among those patients who, having had both seminal vesicles removed, retain their sexual ability and in whom the spermatic function has not been disturbed.

THE SEMINAL TRACT

Essentially, the spermatic tract is formed by the testis, epididymis, vas deferens, ampulla and seminal vesicle, together with the ejaculatory ducts, which empty the spermatozoa into the urethral canal during ejaculation. The vesicles are the reservoir of the semen as the bladder is of the urine.

The seminal vesicles appear embryologically about the third month of intra-uterine life as diverticula or distinct lateral evaginations of the Wolffian ducts.[3] In adults they are situated on each side of the median line in the deep pelvis, underneath the peritoneum at the

* Read before the Section on Urology at the Eightieth Annual Session of the American Medical Association, Portland, Ore., July 12, 1929.

*Owing to lack of space, this article has been abbreviated here by the omission of a table. The complete article appears in the Transactions of the Section and in the author's reprints.

1. Cotton, H. A.: The Etiology and Treatment of the So-Called Functional Psychoses: Summary of Results Based Upon the Experience of Four Years, Am. J. Psychiat. **2**: 157-194 (Oct.) 1922. Billings, Frank: Chronic Focal Infections and Their Etiological Relations to Arthritis and Nephritis, Arch. Int. Med. **9**: 484 (April) 1912; Focal Infection: Its Broader Application in the Etiology of General Disease, J. A. M. A. **63**: 899 (Sept. 12) 1914. Bumpus, H. C.: The Relation of Focal Infection to Diseases of the Urinary Tract, M. Clin. North America **5**: 479-482 (Sept.) 1921.

2. Smith, F. W., and Morrissey, J. H.: Infection of the Seminal Vesicles in Relation to Systemic Disease, J. Urology **9**: 537-545 (June) 1923.

3. Guelliot, O.: Des vésicules séminales: Anatomie et pathologie, Paris, 1883.

base of the prostate between the urinary bladder and the rectum. They are two sacculated organs situated laterally and externally to the vas deferens, uniting with its distended portion, the ampulla, before reaching the prostate, to constitute the ejaculatory ducts, which empty at each side of the verumontanum in the posterior urethra. The vesicles, the corresponding terminal portion of the vas deferens and the ampulla all possess the same anatomic and histologic structure, having a mucosa supporting several layers of muscle, an inner circular and an outer longitudinal. Outside, the fibrous adventitia carries vessels, lymphatics and nerves. The two organs are embedded in an areolar tissue that constitutes a net of fascia and are covered by the two layers of the so-called prostatoperitoneal aponeurosis or the fascia of Denonvilliers,[4] which runs from the apex of the prostate to about the base of the bladder, where the two layers coalesce and continue as the peritoneum.[5] A careful dissection would separate the vesicle from its corresponding ampulla and, when the vesicle is clamped and cut away without tearing or cutting the ampulla, the connection of the lower spermatic tract remains patent and consequently is not disturbed.

On the other hand, when there is tuberculous infection of the seminal tract both the ampulla and the vesicle may be involved and, as Young[6] has shown,

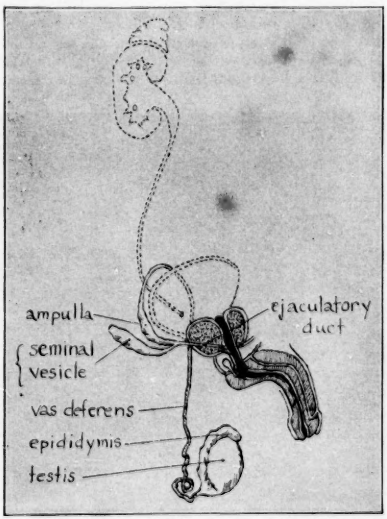

Fig. 1.—Spermatic tract.

the removal of the two will make the patient sterile but not impotent, even when the whole genital tract has to be removed because of the extensive process of tuberculosis.

In this work, rectal examination has revealed that the ampulla is easily palpable and distinctly enlarged, giving a definite impression of its patency and efficiency with regard to the genital and spermatic functions. Furthermore, among this group of patients are two who, after the removal of the two vesicles, still are masturbators and assert that sperm comes through, accomplishing ejaculation, thus corresponding with the

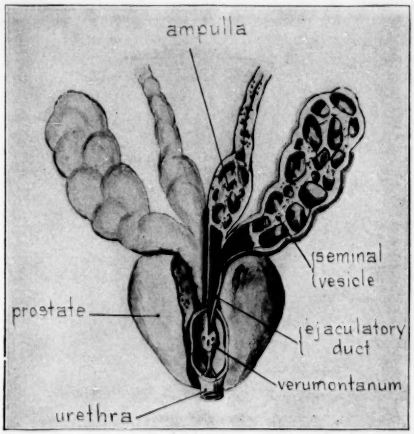

Fig. 2.—Anatomic relation of seminal vesicles to their corresponding ampullae.

examination, which reveals the two patent and palpable ampules, six years after both vesicles were removed at operation.

Therefore, with the visualization of the organs and with a recognized surgical technic, it is possible to remove the seminal vesicles without any disturbance to the physiologic spermatic function. In a later communication I shall discuss the biologic and chemical aspects of the seminal flow as relating particularly to the presence of spermatozoa in patients who have undergone vesiculectomy.

OPERATIVE TECHNIC

In the literature on the surgical approach to the seminal vesicles, the perineal method has received the preponderance of attention since the time of the early writers.

Starting in the last two decades of the nineteenth century, Zuckerkandl,[7] Ullmann,[8] Roux,[9] Weir,[10] von Dittel,[11] Lloyd,[12] Albarran[13] and Proust,[14] Guelliot,[15] Baudet and Kendirdjy[16] called attention to the feasi-

4. Denonvilliers, C.: Propositions et observations d'anatomie, de physiologie et de pathologie, Thèse de Paris, 1837. Cuneo, B., and Veau, V.: De la signification morphologique des aponeuroses périvésicales, J. Anat. **35:** 235-245, 1899.

5. Testut, L.: Anatomia Humana **4:** 820-821. Albarran, J.: Médecine operatoire des voies urinaires, Paris, 1909, pp. 409-513, 738-743.

6. Young, H. H., and Davis, D. M.: Young's Practice of Urology **1:** 275, 1926. Young, H. H.: The Radical Cure of Tuberculosis of the Seminal Tract, Arch. Surg. **4:** 334-419 (March) 1922.

7. Zuckerkandl: Handbuch der Urologie **1.**

8. Ullmann, E.: Extirpation tuberkulösen Samenbläschen, Centralbl. f. Chir. **17:** 137, 1890.

9. Roux: Excision de la vésicale séminalis et du canal déférent en totalité, Semaine méd. **11:** 143, 1891.

10. Weir, R. F.: Cases in Genito-Urinary Surgery, M. Rec., **46:** 161, 1894.

11. Von Dittel: Über Prostatektomia lateralis, Wien. klin. Wchnschr. **40:** 339, 364, 1890.

12. Lloyd, J.: On Inflammatory Diseases of the Seminal Vesicles, Brit. M. J. **1:** 882, 1889.

13. Albarran, J.: Médecine opératoire des voies urinaires, Paris, 1909, pp. 798-838.

14. Proust, R.: La prostatectomie dans l'hypertrophie de la prostate, Paris, 1904.

15. Guelliot, O.: Chirurgie des vésicules séminales, Presse méd. **1:** 193, 1898.

16. Baudet, R., and Kendirdjy, L.: De la vaso-vésiculectomie dans les cas de tuberculose génitale, Rev. de chir. **34:** 380-403; 518-549; 749-774; 828-860.

bility and use of the perineal route in exposing both the prostate and the seminal vesicles. The upper, or suprapubic, route of approach, including the inguinal route of Villeneuve,[17] while in use for some time, has had only a few advocates.

In America, Fuller's operation[18] for vesiculotomy, first described in 1896, marked the beginning of a new era in the surgical treatment of chronic and acute conditions of the seminal vesicles. Young,[19] Squier,[20]

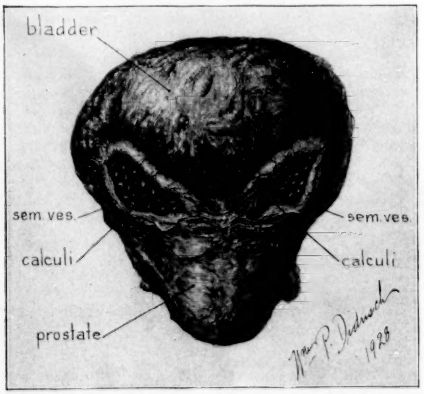

Fig. 3.—Multiple calculi in both seminal vesicles. Drawing from post-mortem specimen. (Courtesy of Dr. Christeller, Virchow Krankenhaus, Berlin.)

Caulk,[21] Cunningham,[22] Geraghty,[23] Lowsley[24] and Smith and Morrissey[25] more recently have introduced several modifications and improvements in the technic of the perineal method of removing and draining the seminal vesicles. The sacral and ischiorectal methods, by the perineal route, have been discussed recently by Völcker,[26] Lichtenberg[27] and Hunt.[28] In 1923, Marion[29] and Walker[30] presented the new method of transvesical approach. However, the perineal method with its modifications remains the operation of choice.

Operation.—The technic employed is as follows: With the patient in the exaggerated lithotomy position as for perineal prostatectomy, and with the urethral seminal vesicle tractor in position, a semilunar incision is made at the raphe of the bulb just between the scrotum and the rectum, running from one ischial tuberosity to the other. The incision is carried deeper into each side of the central tendon and then by blunt dissection with the blade of the knife and the index fingers the central tendon is divided and the bulb properly retracted. At this time, if any bleeding is encountered from branches of the bulbar artery, these are clamped and tied. To prevent unnecessary bleeding, especial care should be taken not to cut into the bulb.

With perfect traction of the bulb and perineal flap by the bifid perineal retractor, the recto-urethralis muscle is carefully divided and gradually separated from the rectal attachments and from the apex of the prostate. Then by means of the index finger inserted for the purpose, the prostate is gradually liberated and separated from the remaining fibers of the recto-urethralis muscle. The levator ani muscles constituting the floor of the pelvis are then carefully retracted. Still a few muscular fibers remain, and these are stripped from the surface of the prostate by gauze dissection. The prostate is exposed and covered by the glistening fascia of Denonvilliers. A superficial transverse incision is made at about the middle of the prostate. The first layer of Denonvilliers' aponeurosis is gradually dissected back by the blade of the knife and after being well separated is retracted with the deep perineal retractor. A second incision is then made and the second layer of Denonvilliers' aponeurosis is dissected as illustrated in figure 5. It is essential that the two layers of Denonvilliers' aponeurosis be carefully separated and the fascia stripped well behind the base of the prostate and the base of the bladder, because otherwise the exposure is most difficult and unsatisfactory. In this long series of cases in which this technic was employed there is no instance of harm done. The ureter has never been palpable and no serious accident has ever occurred. The enucleation of the vesicle is begun with the tip of the index finger, an attempt being made to reach the tip of the vesicle laterally and externally to the vas

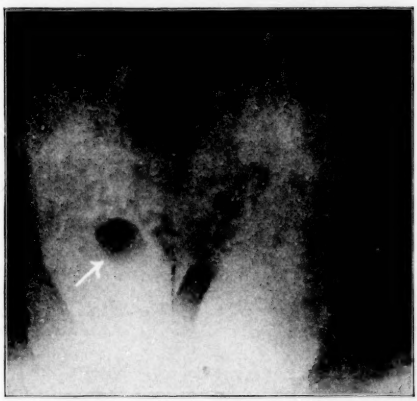

Fig. 4.—Vesiculogram revealing abscess of right seminal vesicle. Delzell's case.

17. Villeneuve: Epididymovésiculectomie. In Assn. franç. pour l'avanc. des sciences, Marseilles, second session, 1891.
18. Fuller, Eugene: Operative Interference in Aggravated Instances of Seminal Vesiculitis, J. Cut. & Gen.-Urin. Dis. **14:** 329, 1896; Seminal Vesiculotomy: Its Purpose and Accomplishments, J. A. M. A. **59:** 1959 (Nov. 30) 1912.
19. Young, H. H.: A Perineal Method for Excising or Draining the Vesicles, Tr. Am. Assn. Gen.-Urin. Surg. **7:** 73, 1913.
20. Squier, J. B.: Indications for Operation on the Seminal Vesicles, Boston M. & S. J. **170:** 908, 1914.
21. Caulk, J. R.: Surg. Gynec. Obst., November, 1915.
22. Cunningham, J. H., Jr.: A Technique for Drainage or Excision of the Seminal Vesicles, Surg. Gynec. Obst. **24:** 487 (April) 1917.
23. Geraghty, J. T.: Urethral Infection, J. A. M. A. **68:** 757 (March 10) 1917.
24. Lowsley, O. S., and Kirwin, T. J.: Textbook of Urology, Philadelphia, 1926, pp. 283-292.
25. Morrissey, J. H., and Smith, F. W.: Surgery of the Seminal Vesicles: Indications, Technique and Results, Surg. Gynec. Obst. **37:** 480 (Oct.) 1923.
26. Völcker, F.: Chirurgie der Samenblasen, Stuttgart, 1912. Fiolle, J., and Fiolle, P.: La chirurgie des vésicules seminales, Paris, 1912.
27. Lichtenberg, A.: Ueber die Indikationesstellung in der Chirurgie der Samenblasen, Klin. Wchnschr. **3:** 2344 (Dec. 16) 1924.
28. Hunt, V. C.: Posterior Incision of the Seminal Vesicle, Ann. Surg. **87:** 257 (Feb.) 1928.
29. Marion, G.: Transvesical Removal of the Malignant Prostate and Vesicles, Encyclopedie française d'urologié **6:** 338, 1923.
30. Walker, J. T.: Transvesical Vesiculectomy and Vesiculotomy, Extr. Sec. Congr. Internat. Soc. Urol. Rome **1,** April 24-26, 1924; J. d'urol. **18:** 181 (Aug.) 1924.

deferens. Exposing the vesicle is difficult because of the many adhesions encountered, particularly in those cases of long standing inflammation in which a process of periseminal vesiculitis is present.

By careful dissection with the help of good retraction and scissors and forceps the vesicle is easily exposed and separated from the ampulla as illustrated in figure 6. After the left vesicle has been clamped,

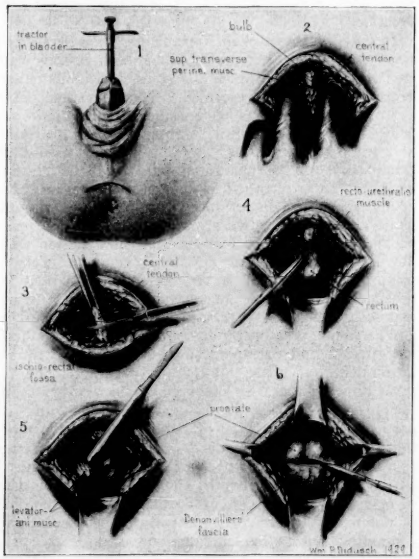

Fig. 5.—Operative technic: 1, patient in exaggerated lithotomy position as for perineal prostatectomy; seminal vesicle urethral tractor in position; semilunar perineal incision is made. 2, index fingers in ischial fossae gaining line of cleavage of the superficial perineal muscles by blunt dissection. 3, exposing bulb of urethra and cutting central tendon of the two ischiorectal fossae. 4, with bulb tractor in position, cutting recto-urethralis muscle with scissors to separate the rectal attachments from the apex of the prostate. 5, method of separating levator ani muscles by blunt dissection and the remaining fibers of the recto-urethralis muscle from its attachments to surface of the prostate. 6, exposure of glistening fascia of Denonvilliers covering prostate gland; superficial transverse incision cutting first layer of Denonvilliers' aponeuroses, with bulb and deep perineal tractor in position; use of two lateral tractors for better exposure.

the right vesicle is exposed in the same manner. When both organs are chronically diseased, they are both removed. When the vesicles are clamped, close to the ducts that unite with the ampullae, they are cut off and the stumps touched with phenol (carbolic acid) and alcohol, followed by a single catgut suture as illustrated in figures 6 and 7. The ampullae are carefully examined to assure patency and then the operation is finished.

It is of particular importance in closing the wound to make three or four sutures near the edges of Denonvilliers' aponeuroses as in figure 7 in order to reconstruct all the anatomic planes and give perfect support to the structures of the deep pelvis, particularly the new rectovesical space with the prostate, rectum and peritoneum. Finally two cigaret drains should be inserted, one inside the prostatovesical space and the other in the rectovesical space behind the reconstructed prostato-fascial layers of Denonvilliers' aponeuroses. The two levator ani muscles are drawn together with two separate deep sutures of chromic catgut, thus closing the floor of the pelvis and leaving the cigaret drains in place, as in figure 7. The wound is closed by bringing the two edges of the skin together by interrupted silkworm-gut stitches and a dressing is then applied. As a rule there is no bleeding or any other complication and the wound heals firmly in about two weeks.

The long urethral seminal vesicle tractor, described by Young, should be placed in position at the beginning of the operation, as illustrated in figure 5, because it is of great assistance in bringing to view the prostate, and in maintaining the proper relationship during the different stages of the operation. The bladder should be filled before the operation with a mild antiseptic solution such as boric acid or distilled water for the purpose of having a better exposure. The plane of cleavage at the time of the enucleation of the vesicles is greatly facilitated, and the separation of the vesicles from the ampullae is more easily accomplished. Hot compresses may be used when there is oozing or

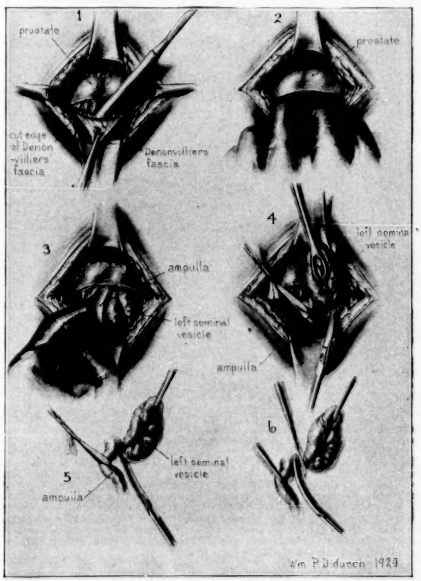

Fig. 6.—Operative technic: 1, dissecting second layer of Denonvilliers' aponeuroses from the posterior face of the prostate with the blade of the knife; recognition of these two layers of prostatic fascia is essential. 2, index fingers separating deeply, by blunt dissection, Denonvilliers' aponeuroses from the base of the prostate; stripping the layers back from the base of the bladder to free vesicles from net of fascia. 3, enucleation of the seminal vesicles with the finger tips, after careful blunt dissection of tip of vesicle. 4, dissection of seminal vesicles from the fascial plane of adhesions, and separation from ampullae. 5, method of separating and dissecting entirely the seminal vesicles from the ampullae. 6, method of clamping and excising the seminal vesicles from the ampullae.

bleeding, to save time and to keep clean the operative field. No actual hemorrhage or shock is encountered.

Especial care should be taken to keep away from the rectum when cutting the recto-urethralis muscle, to avoid the formation of rectal fistula. In certain cases

it is advisable to be guided by the left index finger in the rectum, to protect the viscus from injury.

The membranous urethra is exposed during the operation and also the triangular ligament at the apex of the prostate is seen, but, as the urethra is not open and neither sphincter cut, incontinence of urine has never been observed.

On the whole, this operation seemed to upset the patients less than many other surgical procedures.

SUMMARY

Of the 100 cases here reported, I may say that, according to the records of the hospital, all of these patients have had a complete physical, clinical and laboratory examination before being presented to the staff meeting, where a definite classification and a provisional diagnosis were made. Furthermore, all patients have first received all necessary surgical attention in order to remove all possible foci of infection

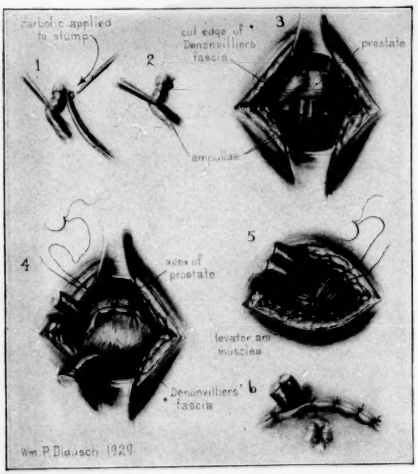

Fig. 7.—Operative technic: 1, method of applying phenol, following alcohol, to stump of ampulla. 2, ligature after vesicle has been excised, with normal integrity of remaining ampullae. 3, bulb and perineal tractor in position, showing complete and most satisfactory view of the operating field and the patency of the two remaining ampullae of the vas deferens after seminal vesicles have been removed. 4, method of suturing fascia of Denonvilliers' aponeuroses to secure perfect healing; reconstruction of this anatomic structure is of paramount importance; a small cigaret drain is placed at the base of the prostate, and another behind the reconstructed fascial plane deep in the perineum. 5, reconstruction of the perineum, bringing the two levator ani muscles together by two deep sutures; cigaret drains brought to one side. 6, closure of wound with interrupted silkworm-gut, leaving cigaret drains in place.

before being given a genito-urinary examination. (For example: All patients were checked up for infected teeth or alveolar abscesses, chronic tonsillitis, chronic otitis media, and chronic inflammations of the paranasal sinuses, including the antrum of Highmore. Also serologic and bacteriologic tests, and roentgen examinations have been made.) Therefore the clinical results obtained in this group of mental cases, from the actual vesiculectomy operation, must be considered only as a factor contributing to the cure or as a part of the generalized plan of treatment. The vesicle operation should not be advised until all other local foci of infection have been previously removed.

The records and histories of patients and the desired information for this study have been found to be scattered and some times insufficient, although an account of the work accomplished is here submitted.

In this series of mental patients, 100 were operated on during the year 1923-1924 for definite pathologic lesions found in the seminal vesicles, as described in the accompanying summarized table.

In all cases the perineal method of approach has been used, following more or less the technic here described.

In ninety-eight cases the type of operation performed was seminal vesiculectomy, in which both vesicles were excised. In the two remaining cases, vesiculotomy and prostatotomy were performed. The operations were performed under general anesthesia, ether and gas being used for the narcosis. All patients had a striking and uneventful recovery both from the immediate traumatism of the operation and from the general condition, as is recorded here in many instances. No complications of importance were encountered, and while a few wounds were infected they all recovered promptly. Perineal or rectal fistula has not been seen, nor has epididymitis or any other common urologic complication occurred, as is observed sometimes in prostatectomy. The membranous urethra, while exposed during the operation, has not been opened in any instance. The operations have been extra-urethral, extravesical and extraperitoneal, and that is why no incontinence of urine, no case of peritonitis and no other difficulty has been observed. The recovery from the operation has been decidedly good and most unusual particularly for this type of patient. Operative mortality was nil, but eight deaths occurred in this series as a result of disease or of suicide. An average time of two years and three months elapsed between the date of operation and the date of death. Two patients died of pulmonary tuberculosis and two of pneumonia; two committed suicide by hanging, one died of constitutional brain disease, diarrhea and nephritis, and one died of cardiorenal insufficiency.

The incidence of age was as follows: Six per cent were between 16 and 19 years; 43 per cent between 20 and 30 years; 26 per cent between 31 and 40; 13 per cent between 41 and 59, and 12 per cent were not recorded, making a total of 100 per cent.

The average age of the patients was 30½ years. The youngest patient was 16 and the oldest 59 years.

A diagnosis of chronic vesiculitis was made in almost all of the 100 cases, on the basis of the urologic observations.

The clinical diagnoses in this group of patients on whom seminal vesiculectomy was performed were: dementia praecox, fifty-six cases; paranoid condition, fourteen cases; manic-depressive insanity, thirteen cases; alcoholic hallucinations, four cases; mental deficiency, three cases; neurasthenia, two cases; unclassified, two cases; epilepsy, one case; paresis, one case; toxic psychosis, two cases; constitutional inferiority, one case, and alcoholic imbecility, one case, giving a total of 100 cases.

The pathologic observations are scattered and incompletely recorded. However, the actual observations are considered from two distinct standpoints: (1) macroscopic, during operation, and (2) microscopic, as found in histologic sections and in laboratory examination.

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1. Two cases with actual pus were encountered at operation. In many instances, swollen or much distended vesicles that did not empty by manipulation were observed during the operation. Dillon and Blaisdell,[31] Barney,[32] Cunningham,[33] Völcker [26] Guelliot,[3] Geraghty [23] and others have discussed extensively the surgical pathology of the seminal vesicles and the first two writers describe in full four groups depending on histologic evidence of intrinsic and extrinsic changes. In these cases it was interesting to find the vesicles bent down and with fibrotic bands of adhesions that made the dissection from the underlying plane of fascia most difficult, and indicating the association of an extensive process of periseminal vesiculitis. In some cases the vesicles were plastered to the walls of the bladder and adhered to the layers of Denonvilliers' aponeuroses so that normal drainage was impossible and the lumens of the vesicles were obliterated. Often the obliteration of the lumens of the excretory ducts is due to stenosis of the ejaculatory ducts caused by débris or inflammatory changes.

2. The microscopic observations, including the histologic study and the laboratory report of microorganisms found in cultures, show the presence of the following bacteria: *B. coli-communis,* thirteen; *B. aerogenes,* one; *Staphylococcus albus,* twelve; *Staphylococcus aureus,* six; *Streptococcus viridans,* one; *Streptococcus hemolyticus,* one, and eleven unclassified streptococci; six unclassified staphylococci, and one unclassified diplococcus. There was no growth in six cases, and no record of the laboratory observations in forty cases; 38 per cent of the specimens removed showed definite infection or positive culture. Histologic sections showed more or less thickening of mucous folds as a result of round cell infiltration and granulation tissue, with some denuding of the mucous membrane along the lining cavity. In other sections the folds became more fibrous and formed recesses between one another, containing inflammatory exudates, secretion, necrotic cells and sometimes micro-organisms. There was also obliteration of the labyrinth or lobules and also of the lumens with thicker fibrotic sheaths and many leukocytes and round cell infiltration, revealing the extent of the local process of chronic vesiculitis.

The time that these patients stayed in the surgical wards after the vesicle operations were accomplished varied from twelve days to four and one-half weeks. The average time was two weeks.

The surgical results obtained in these cases were beyond expectation, as has already been mentioned. The perineal wound healed firmly, without incident or sequelae of any kind. In the postoperative care the stitches were removed, in nearly all cases, at the end of six days, and many patients were out of bed in ten or twelve days. If any gauze packings were used because of persistent oozing or bleeding, these were removed, together with the cigaret drainage, between the third or fourth day after the operation, in order to save days of convalescence in the surgical ward. Every patient received an ounce of castor oil and a rectal enema the third or fourth day after operation, and every wound was dressed daily.

The later clinical and functional results of this summary of cases shows most striking and convincing figures because of the 100 mental cases considered incurable: for after being submitted to this type of surgical therapy, 48 per cent were improved or discharged from the institution as definitely improved and some as cured. A few of these patients still are in the hospital working and doing well, and a few others who were discharged as much improved or cured have had relapses of the mental condition and have been readmitted. Some in this readmission group have improved or come back to normal but others have remained the same.

There were twenty-seven patients who remained in the same mental state, i. e., unimproved, and in seventeen cases the condition was not recorded or reexamination has not been made. There were eight later deaths already mentioned. Therefore a total of 52 per cent of the patients have received apparently no benefit from the general plan of surgical therapy.

The reexaminations made by me at the hospital during the two months May and June, 1929, have been undertaken in a most careful manner and the observations have been a most interesting phase of this study. They have revealed a new series of observations never before mentioned or recorded in the literature of this subject. The fact that the ampulla of the vas deferens has remained patent and definitely palpable by rectal touch in more than 21 per cent of the cases in which both vesicles were previously excised is of great importance not only in regard to the anatomy and physiology of the spermatic tract but also in regard to the preservation of the sexual function. The spermatic and genital functions remain unaltered.

I have always been convinced, since the beginning of this work in 1922, that the removal of both seminal vesicles in this type of chronic vesiculitis does not alter either the genital integrity or the spermatic function. The ampulla or the terminal distended portion of the vas deferens has the same anatomic disposition and histologic structure as the seminal vesicle itself (fig. 2) and, when the vesicles become diseased or obliterated or are excised surgically, the ampulla by its normal physiologic proce becomes gradually distended and finally supplants the function of the vesicles, becoming the reservoir of the semen and having the same power of expulsion during the ejaculation. Moreover, the vesicles topographically are analogous to the gallbladder, and it is a well known fact that in the biliary tract when cholecystectomy is performed the hepatic function is not disturbed. The gallbladder and its cystic duct unite with the hepatic duct, forming the common bile duct or "ductus choledochus," and when the gallbladder or storehouse of the bile is removed, the hepatic function is not affected, mainly because of the patency of the excretory common duct. There is greater coincidence in the similarity of these two tracts, because anatomically and functionally the vesicles unite with the ampullae before reaching the prostate, forming the common duct or ejaculatory ducts that traverse the prostate, independently, through a lamellar tissue described by Lowsley,[34] and open into each side of the prostatic utriculus at the verumontanum to conduct the spermatozoa together with the secretions of the other excretory glands of the urogenital tract into the urethra during the act of ejaculation. It is my purpose to report more conclusive observations in a later communication.

31. Dillon, J. R., and Blaisdell, F. E.: Surgical Pathology of the Seminal Vesicles, J. Urology **10**: 353-365 (Nov.) 1923.
32. Barney, J. D.: Recent Studies in the Pathology of the Seminal Vesicles, Boston M. & S. J. **171**: 59-62, 1914.
33. Cunningham, J. H.: Operative Treatment of Inflammation of the Seminal Vesicles, J. Urology **3**: 175 (Aug.) 1919.

34. Lowsley, O. S.: The Development of the Human Prostate Gland with Reference to the Development of Other Structures at the Neck of the Urinary Bladder, Am. J. Anat. **13**: 299, 1912.

The external genital organs, on reexamination, were found to be normal or the same as before the operation in practically all cases. The scar of the perineal wound, six or seven years after the operation, was firmly healed in every case. Rectal examination showed the prostate gland normal in size and consistency in about 80 per cent of the cases. However, a few cases were found of boggy, leathery or irregularly shaped prostate and some with adhesions or rectal attachment. Ten per cent of the cases examined showed slightly hypertrophied or adenomatous conditions by the rectal digital touch, but these were unnoticeable clinically because no urinary symptoms were present.

Finally, in 5 per cent of the cases a peculiar fibrotic band of tissue was found by rectal examination at the base of the prostate running from the right to the left side of the median line. Sometimes it was easily palpable and extended beyond the prostate at the base of the bladder, giving a definite impression of being the remaining layers of Denonvilliers' aponeuroses, which were loose in the rectovesical space as if they had not been sutured to the apex of the prostate, as illustrated in figure 6. These bands of adhesions were of no particular significance except that they made the palpation of the ampullae impossible and showed the importance of preserving all layers of fascia and lines of cleavage. They must be reconstructed and sutured in a proper way just as in any other operation.

CONCLUSIONS

The perineal method, as in prostatectomy, was the operative technic employed in 100 consecutive seminal vesiculectomies without a death.

The results obtained from excision of both seminal vesicles in this series of cases were satisfactory and beyond expectation, and proved that surgery of the seminal vesicles, when a recognized technic is used, particularly the perineal method, is a safe operative procedure.

The operation performed was extra-urethral, extravesical and extraperitoneal. Consequently, the common sequelae, mentioned by many writers, of perineal or rectal fistula, epididymitis or urinary incontinence were not encountered in this series of cases.

In the review of this work, not a single death resulted from the operation, although there were eight deaths due to different causes, and these occurred at an average time of two years and three months after operation.

When the vesicles are removed and the ampullae are not torn, the connection of the lumen of the vas deferens remains patent and therefore the spermatic function is not disturbed.

The ampulla or remaining portion of the seminal tract gradually becomes distended and hypertrophied and supplants the physiologic function of the vesicles, thus becoming the reservoir of the semen.

On reexamination of these patients, on whom seminal vesiculectomy was performed six or seven years ago, the ampullae were found to be patent and easily palpable by rectal touch in more than 21 per cent of the cases.

The external genital organs were normal or the same as before operation in all cases. The scar of the perineal wound was firmly healed in every case.

The prostate gland was found normal in about 80 per cent of the cases, and slightly hypertrophied or enlarged or adenomatous in about 10 per cent of the cases, but no urinary symptoms were present.

A definite fibrotic band, running from right to left at the base of the prostate, was found in 5 per cent of the cases, because of loose or unsutured Denonvilliers' aponeuroses.

The sexual ability has remained apparently unchanged in most instances.

Of the specimens removed at operation, 38 per cent showed infection or positive culture. Also, histologic sections revealed in many instances the presence of inflammatory changes of chronic vesiculitis.

Psychotic patients suffering from chronic vesiculitis which may account for the functional defect or toxic infection, after receiving the ordinary medical treatment, should receive the benefits of surgical therapy, provided all other foci of infection have been previously removed.

In this series of 100 mental cases, summarized in this report, 48 per cent were discharged or definitely improved, while 52 per cent remained mentally unimproved. The doctrine of focal infection is worthy of consideration, especially in dealing with patients having mental disorders.

The surgery of the seminal vesicles has become a reality, and, with adequate perineal technic, seminal vesiculectomy is preferred to seminal vesiculotomy.

32 East Sixty-Fifth Street.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. JOHNSON AND GUTIERREZ

DR. FRANKLIN FARMAN, Los Angeles: Many of the operations in urology have been slow of recognition and popularization, and this is particularly true of the operation of seminal vesiculectomy. The reasons for this are obvious: The seminal vesicles are buried, inaccessible structures, and their removal is not easily carried out. Likewise the value of the operation is not well known, probably because many men have not taken the trouble to investigate the subject. We have Dr. Gutierrez to thank for bringing to us a large series of seminal vesiculectomies and his results should especially command our attention. He has shown that his type of perineal operation, being as it is extra-urethral, extravesical and extraperitoneal, is safe in trained hands, and preserves both sphincter control and spermatic function. One type of operation I wish to mention is the posterior excision of the seminal vesicles through an incision similar to that used for posterior resection of the rectum for carcinoma. This method of vesiculectomy has been used by Hunt, and he recommends it highly. The indications for seminal vesiculectomy are not well understood and are not clearly defined in the minds of many. No doubt many unresponsive and unresolving cases of chronic seminal vesiculitis are suitable for this operation. They produce many genital symptoms and are one cause of semi-invalidism in the male. When there is perivesiculitis, the normal function (ureteral peristalsis) of the ureter may be interfered with, and this may lead to upper urinary tract infection and kidney injury, as has been pointed out by Professor von Lichtenberg. It is probably better to remove a diseased vesicle than to permit kidney injury. The work of Belfield, McCarthy, Lowsley, Delzell and others has greatly facilitated the medication and diagnosis of diseases of the vesicles. Vasotomy, catheterization of the ejaculatory ducts and vesiculography should be practiced more intensively, as there is a great deal to be learned about the successful treatment of vesiculitis. Finally, vesiculectomy, as Dr. Gutierrez has so clearly shown today, is an operation of much merit, offering relief to patients otherwise destined to ill health. Dr. Gutierrez has opened up anew the relationship between certain types of mental disease and genital disease, and this indicates the need for collaboration between the field of neuropsychiatry and genito-urinary study.

DR. P. G. FLOTHOW, Seattle: It seems to me we are getting rather "hipped" on doing one thing exclusively. One man says we should use sacral anesthesia, and another says we should

use the spinal method. I am glad to hear Dr. Johnson say that he uses all types of local anesthesia. I believe that is the correct method.

DR. OSWALD S. LOWSLEY, New York: Seminal vesiculectomy has had a limited use. Dr. Gutierrez has had an excellent opportunity at the State Insane Asylum of New Jersey to do a large number of operations and he has improved the opportunity. I think the diagnostic methods now employed, either the use of Delzell's needle through the endoscope or the more recent method of McCarthy, tell just when to remove the seminal vesicles. We find very few seminal vesicles in ordinary urologic practice that have to be removed, but when seminal vesiculectomy is necessary the results are quite spectacular. It seems that the pendulum is swinging the other way. There was a time when Dr. Cunningham and others were doing a large number of these operations and then the procedure fell into disrepute because of its effect on the sexual apparatus, which is temporary. As Dr. Gutierrez pointed out, the ampulla should be left alone unless it is diseased. If diseased it should be drained and the patients should be informed that they will be sexually depressed for six months or so. It usually lasts only three months, but they are delighted when it does not last six. Regarding Dr. Johnson's paper, I think that there has been a really fundamental advance in this anesthesia during the last several years. We have been using regional anesthesia in all of our cases for six years, and in most of them for eight years. By Henline's modification of some methods that were in use, we have been able to get 98 per cent successful anesthesias for kidney operations. We at first got only about 36 per cent successful anesthesias. We have not used spinal anesthesia, but we probably should. The other types are slower but better for the patient, in our opinion. Dr. Johnson mentioned the elimination of all drugs as a preliminary to this anesthesia. That is excellent and I wish to endorse it thoroughly. This is not the urologist's job but the anesthetist's. Each anesthetist should be able to advise the surgeon as to the best type of anesthesia for each particular patient. If anesthetists are not perfecting themselves in methods of regional anesthesia, they are missing a great opportunity.

DR. H. W. HOWARD, Portland, Ore.: I have done many prostatectomies by infiltration anesthesia, successfully injecting the abdominal wall, bladder and periprostatic tissue. I have been much pleased with this method and the control is perfect. I have done a few seminal vesiculectomies with remarkable success in cases of arthritis in which the seminal vesicles were focal. In some instances an epididymitis has followed, which I presume was due to the fact that I had cut the vas deferens as well. It is noteworthy that Dr. Gutierrez avoids this, presumably by doing an amputation of only the seminal vesicles.

DR. TERRY M. TOWNSEND, New York: Dr. Johnson has presented sound arguments for spinal anesthesia, yet inadequately strong for the value of the procedure. If spinal anesthesia is the method of choice in desperately ill patients, why is it not more definitely indicated in patients with less demonstrable disease? My enthusiasm for the method arises from my having used it in more than 200 cases in the past five years as well as from observation of many of the 2,000 cases of Dr. Charles Clark Sweet, chief surgeon of Sing Sing Prison Hospital during the same period. In no instance have we had the slightest anxiety concerning the patient. Three years ago Chute of Boston called attention to the advantages of spinal anesthesia in urologic surgery and assured us that any patient with reasonably normal arterial tension was a fit subject for its use. There are, however, other factors than hypotension which prevent its administration. There are occasional apprehensive patients who decline to enter the operating room except under narcosis. Again, some physicians referring patients remember the unfortunate disasters of Jonnesco and his followers during the developmental stage of spinal anesthesia and forbid the use of the method in their patients. The outstanding advantages of the anesthesia are as follows: First is its safety. In imposing no added burden of elimination to the heart and kidneys, it leaves these organs uninjured. Second, the single insertion of a needle reduces sources of error in the introduction of infection. Third, immediate and complete anesthesia, such as always occurs with successful injection, saves valuable time to all concerned. Fourth, the dose may be varied. Operative interventions requiring only a few moments need but a fractional dose. Finally, timid patients may be assured that throughout the operation they will remain fully conscious and without pain. I have demonstrated that spinal anesthesia can be done as an office procedure and is without deleterious effects in selected cases. In my office I administered one third of the usual dose to a patient and performed litholapaxy without pain; four hours later, with complete restoration of motor and sensory impulses, he traveled alone to his apartment. There was no subsequent reaction.

DR. ROBERT GUTIERREZ, New York: In reporting this series of seminal vesiculectomies, I did not wish to enter into a discussion of the routine medical treatment, which clinically is obviously well established, and has been described by many writers. However, the pathologic observations and results obtained in this work have revealed that in certain cases the clinical results are most gratifying, particularly in cases depending on a focal infection. The historical aspect and other features of this presentation are well take in my paper, which I did not read in full for lack of time. I believe, and this is the attitude at the hospital, that palliative treatment should first be instituted before surgery of the seminal vesicles is considered."

PHOTO-ELECTROMETER WITH ONE STAGE OF AMPLIFICATION

AS APPLIED TO THE DETERMINATION OF HEMOGLOBIN *

CHARLES SHEARD, PH.D.
AND
ARTHUR H. SANFORD, M.D.
ROCHESTER, MINN.

At the meetings of the American Society of Clinical Pathologists held in Minneapolis in June, 1928, we presented a paper regarding the use of the photoelectric cell as a mechanical eye for the quantitation of hemoglobin, a galvanometer being employed as a measuring instrument. Since that time we have published a paper on a photo-electric hemoglobinometer.[1] In that communication we presented the following data:

1. A brief discussion [2] of various methods of determining the percentage or grams of hemoglobin and their sources of error, including the recent investiga-

* From the Division of Physics and Biophysical Research and the Clinical Laboratories, the Mayo Foundation and the Mayo Clinic.

* Read before the Section on Pathology and Physiology at the Eightieth Annual Session of the American Medical Association, Portland, Ore., July 11, 1929.

* Patent applications are pending which cover the use of photo-electric cells in the measurement of hemoglobin and the general principle of the applications of such methods with selective spectral filters to the determination of the amounts of unknown substances in solution, both with and without various accessories, such as one or more stages of amplification and various detecting devices. These applications for patent rights have been made in order to control the development, accuracy and general serviceability of such devices, so that those who acquire apparatus involving the principles disclosed may secure satisfactory equipment. Assignment of any rights granted will be made to the American Society of Clinical Pathologists.

1. Sheard, Charles; and Sanford, A. H.: A Photo-Electric Hemoglobinometer: Clinical Applications of the Principles of Photo-Electric Photometry to the Measurement of Hemoglobin, J. Lab. & Clin. Med. **14**: 558-573 (March) 1929.

2. Haden, R. L.: The Normal Hemoglobin Standard, J. A. M. A. **79**: 1496 (Oct. 28) 1922. Haldane, John: The Colorimetric Determination of Hemoglobin, J. Physiol. **26**: 496-504, 1900-1901. Haldane, John; and Smith, J. L.: The Mass and Oxygen Capacity of the Blood in Man, ibid. **25**: 331-343, 1899-1900. Kern, R. A.: Problems of Clinical Hemoglobin Estimation, M. Clin. North America **8**: 821-831 (Nov.) 1924. Lindsay, J. W.; Rice, E. C., and Selinger, M. A.: A Plea for a Standardized Method of Estimating and Reporting Hemoglobin Values, J. Lab. & Clin. Med. **11**: 737-742 (May) 1926. Newcomer, H. S.: Absorption Spectra of Acid Hematin, Oxyhemoglobin and Carbon Monoxide Hemoglobin: A New Hemoglobinometer, J. Biol. Chem. **37**: 465-496 (March) 1919. Newcomer, H. S.: A New Optical Instrument for the Determination of Hemoglobin, J. Biol. Chem. **55**: 569-574 (April) 1923. Senty, E. G.: A Comparative Study of Various Methods of Hemoglobin Determination, J. Lab. & Clin. Med. **8**: 591-604 (June) 1923. Williamson, C. S.: Influence of Age and Sex on Hemoglobin, Arch. Int. Med. **18**: 505-528 (Oct.) 1916.

tions of Haskins and Osgood,[3] of Kennedy[4] and of Exton.[5]

2. A description of a new type of instrument, the photo-electrometer, applied to the accurate and rapid determination of hemoglobin expressed in grams for each hundred cubic centimeters of blood.

3. Complete details regarding the modus operandi of the photo-electric hemoglobinometer.

4. The theoretical considerations involved in photo-electric photometry as applied to determinations of hemoglobin, indicating that the readings on the instrument should follow the laws of Lambert and of Beer, when determinations are made with a selective spectral filter which transmits light only in the region of one of the absorption bands of oxyhemoglobin, namely, 540 millimicrons (5,400 angstroms).

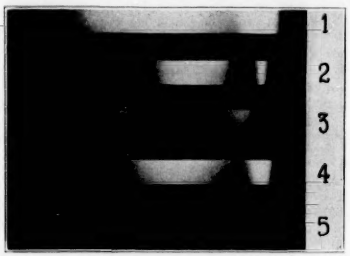

Fig. 1.—Spectrograms: 1, continuous spectrum of incandescent tungsten lamp; 2, oxyhemoglobin bands with centers at 580 and 540 millimicrons; 3, transmission spectrum of Eastman Wratten filter number 74; 4, spectrogram of blood diluted 1:200 showing beta-oxyhemoglobin band; 5, spectrogram of light transmitted through the combination of blood diluted 1:200 and the Eastman Wratten filter number 74.

5. Experimental data obtained by the van Slyke,[6] spectrophotometer and photo-electric hemoglobinometer and their comparison.

6. Data indicating that the photo-electric hemoglobinometer will permit determination of grams of hemoglobin within less than 5 per cent of the van Slyke determinations, which have been used as standards.

Experimentation during the last year has confirmed our observations and the claims which we have made regarding both the accuracy and the rapidity of the method. Feeling, however, that the use of a delicate galvanometer militated against the method, since it was difficult to transport readily and keep in working order, and involved the danger of breakage of suspensions as well as other mechanical difficulties, we have undertaken the construction of an instrument which involved one stage of amplification so arranged that readings could be made on a portable micro-ammeter, thus adding rigidity and portability to an ensemble which possessed a high degree of accuracy and rapidity of operation.

FUNDAMENTAL PRINCIPLES OF PHOTO-ELECTRIC PHOTOMETRY AND SPECTROPHOTOMETRY

The photo-electric cell is a mechanical eye which does not suffer from the elements of fatigue and uncertainty in the determination of the amount of illumination (as obtained by methods involving matches of equality of illumination) as in the case of the eye of man. The current which flows in the circuit containing the photo-electric cell is at all times proportional to the illumination which the cell receives, provided the voltage and resistance in the circuit remain constant. If the photo-electric cell is illuminated by a source of light which can be kept constant, the reading on a galvanometer or sufficiently sensitive ammeter will be a constant. When, therefore, a solution of a substance which contains a characteristic absorption band is placed between the source of illumination and the photo-electric cell, together with a selective spectral filter which transmits radiant energy only in the region of the characteristic band, the amount of light which reaches the photo-electric cell will depend on the concentration of the substance (in solution) possessing the specified absorption band. According to the laws of Lambert and Beer, the concentration of the given substance will be directly proportional to the negative logarithm of the unabsorbed light. Since the current in the circuit containing the photo-electric cell is directly proportional to the amount of illumination which it receives, it follows that the concentration of the substance under investigation which possesses a characteristic absorption zone when in solution is directly proportional to the negative logarithm of the unabsorbed light.

CRITERIA IN PRACTICAL PHOTO-ELECTRIC HEMOGLOBINOMETRY

It is evident, therefore, that it should be possible to apply the theoretical principles of photometry and spectrophotometry to the practical determination of the number of grams of hemoglobin for each hundred cubic centimeters of blood if certain criteria can be met or if certain experimental procedures can be carried out. These criteria and procedures are:

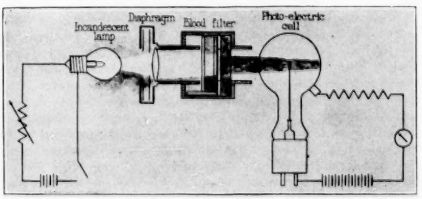

Fig. 2.—A schematic diagram of the essential physical features of the photo-electrometer as applied to the measurement of hemoglobin.

1. The conversion of hemoglobin to oxyhemoglobin, with its spectrum possessing characteristic absorption zones with maximal absorption points at practically 580 and 540 millimicrons in the visible region.

2. The selection of a spectral filter which will transmit incident light in one and only one of the regions in which the oxyhemoglobin of the blood absorbs light.

3. The maintenance of a constant source of illumination, and a ready and rapid method of assurance that this constancy is maintained.

3. Haskins, H. D., and Osgood, E. E.: Methods of Estimating Hemoglobin, Northwest Med. **25**: 500-503 (Sept.) 1926. Osgood, E. E.: Hemoglobin, Color Index, Saturation Index and Volume Index Standards, Arch. Int. Med. **37**: 685-706 (May) 1926. Osgood, E. E., and Haskins, H. D.: A New Permanent Standard for Estimation of Hemoglobin by the Acid Hematin Method, J. Biol. Chem. **57**: 107-110 (Aug.) 1923.

4. Kennedy, R. P.: The Use of Light Filters in Colorimetry, with a Method for the Estimation of Hemoglobin, Am. J. Physiol. **78**: 56-63 (Sept.) 1926.

5. Exton (A New Method of Colorimetry, J. Optic. Soc. Am. **14**: 134, 1927), we believe, claims priority in the matter of the application of color filters in the estimation of various substances in the blood and urine. In a paper before the Optical Society of America, October, 1926, he wrote: "The new method measures color at its greatest density or the frequency most absorbed by isolating the absorption band with a color filter and measuring its intensity by depth or by neutral wedge."

6. Van Slyke, D. D.: Gasometric Determination of the Oxygen and Hemoglobin of Blood, J. Biol. Chem. **33**: 127-132 (Jan.) 1918. Van Slyke, D. D., and Stadie, W. C.: The Determination of the Gases of the Blood, ibid. **49**: 1-42 (Nov.) 1921.

4. The degree of accuracy of dilution of blood with a 0.1 per cent solution of sodium carbonate.

5. The possibility of obtaining solutions of blood free from turbidity.

6. The possibility of obtaining glass containers for holding the samples of diluted blood which are sufficiently near 1 cm. in depth to enable a group of such containers to be used in routine clinical work.

7. The rapid adjustment of the instrument (through manipulation of the iris diaphragm and so forth) to

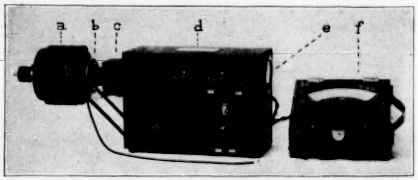

Fig. 3.—The photo-electrometer: *a*, lamphouse and sources of illumination; *b*, adjustable iris diaphragm; *c*, receptacle for holding diluted sample of blood and selective spectral filter; *d*, container for photo-electric cell and one stage of amplification; *e*, meter for reading current in illuminating circuit; *f*, micro-ammeter for reading current in circuit containing the photo-electric cell.

give a reading of 100 on the scale of the ammeter used for recording the current in the circuit containing the photo-electric cell.

8. The possibility of rapid replacement of photo-electric cell, radio (vacuum) tube, grid-leaks and the like, still permitting the measurements of hemoglobin to be made as accurately as with other cells and accessory apparatus.

OXYHEMOGLOBIN BANDS AND SELECTIVE SPECTRAL FILTER

The hemoglobin of the blood is readily converted into oxyhemoglobin, with the possible exceptions of the rather rare conditions of sulphemoglobin and methemoglobin. We propose to make a study of the hemoglobin content of blood in conditions of sulphemoglobinemia and methemoglobinemia by the van Slyke, photo-electric hemoglobinometer and spectrophotometer. The two bands of oxyhemoglobin, known as the alpha and beta bands, have maximal absorption at 578 and 542 millimicrons, respectively. A characteristic spectrum of oxyhemoglobin is shown in figure 1.

Various types of selective spectral filters (that is, solutions or gelatin films) may be employed for the isolation of the beta oxyhemoglobin band. In the work on the determination of hemoglobin we have used the Eastman Wratten filter number 74 for the reason that its transmission spectrum corresponds quite closely to that of the absorption spectrum of the beta band of oxyhemoglobin. This filter is an inexpensive commercial product and retains its percentage transmission at various wavelengths with great accuracy over a period of at least a year, as we have demonstrated by experimental tests.

Davis and Sheard,[7] in a paper on the spectrophotometric determination of hemoglobin, showed that the value of the absorption ratio at 542 millimicrons is 0.001100 ± 0.000003. Since the selective Eastman Wratten filter number 74 is not monochromatic in the character of its transmission, it is obvious that the average absorption constant of hemoglobin will be greater than in the case of spectrophotometric determinations at the wavelength of maximal transmission. We have determined by experimentation and calculation that the absorption constant of the photo-electric hemoglobinometer, when used with diluted blood and the filter 74, is 0.00222. In order to be able to calculate immediately the number of grams of hemoglobin for each hundred cubic centimeters of blood, making use of the formula $C = -K \log A$ (in which C is the concentration and A is the reading of the micro-ammeter in the photo-electric hemoglobinometer), we have determined the absorption constant (K) to be 44.5. This value of the absorption ratio remains constant irrespective of the sensitivity of the photo-electric cell, type of radio tube, recording ammeter or accessory resistances and potentials in the one stage of amplification employed. This fact adds to the universality of use of the photo-electric hemoglobinometer and obviates the necessity of further calibration in the case of any experimental ensemble of this character when used for the determination of hemoglobin.

THE PHOTO-ELECTROMETER AS A HEMOGLOBINOMETER

The fundamental principles on which the photo-electric hemoglobinometer operates are diagrammatically and pictorially shown in figure 2.

The illumination from an incandescent lamp, operated at a known and constant current, passes through an iris diaphragm, and a lens which renders the light slightly convergent before it passes through the diluted blood and filter and thence into the photo-electric cell. In order to obtain a constant reading of 100 micro-amperes on the ammeter in the circuit containing the photo-electric cell, adjustment is made of the iris diaphragm as occasion demands. In general, after the incandescent lamp has been in operation for a few minutes, the current in the circuit containing the photo-electric cell becomes constant and remains so for an hour or more.

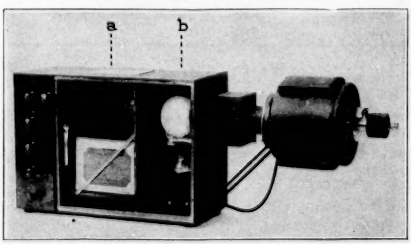

Fig. 4.—The photo-electrometer: *a*, the one stage of amplification with vacuum tube; *b*, the photo-electric cell in position.

THE PHOTO-ELECTRIC HEMOGLOBINOMETER WITH ONE STAGE OF AMPLIFICATION

Photographs of the new instrument in which we have employed one stage of amplification, thus enabling us to read the current in the circuit containing the photo-electric cell with a micro-ammeter (Sensitive Research Instrument Company, New York), are shown in figures 3 and 4.

7. Davis, G. E., and Sheard, Charles: The Spectrophotometric Determination of Hemoglobin, Arch. Int. Med. **40**: 226-236 (Aug.) 1927.

A diagram of the essential features of the electrical apparatus and connections, together with values of the voltages, resistances, potentiometers and types of radio tubes, is given in figure 5. In operating the instrument, the filament current in the CX 301 A tube is set at 250 milliamperes (M. A., fig. 5) by means of the variable resistance R_2. The positive (plus) end of the battery B is then connected to the plate of the radio tube V and the photo-electric cell, P. E. C. When this common point of connection is made, the needle of the micro-ammeter indicates approximately seventy divisions. In order to bring the pointer of the micro-ammeter back to zero, connections from battery B_1 and B_2 are made to the potentiometer R_4, thus setting up a counter electromotive force. Up to this point of the procedure the whole of the resistance R_5 (500,000 ohms) is in series with the micro-ammeter. This resistance is now gradually decreased and, if the needle of the micro-ammeter does not remain at zero, it is again brought back to this point by adjustment of the potentiometer R_4.

The empty cell, used to contain the diluted sample of blood, is placed in the instrument between the iris

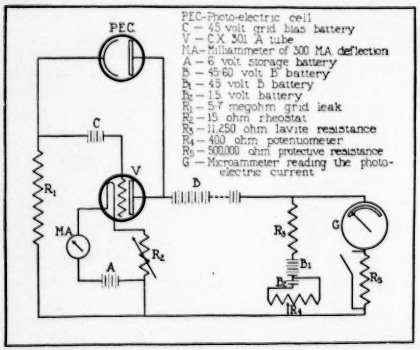

Fig. 5.—Diagrammatic sketch showing the electrical hook-up of the photo-electrometer.

diaphragm and the selective spectral filter, the shutter is opened, and the iris diaphragm adjusted or the current in the illuminating circuit increased or decreased until the reading on the ammeter is 100. The fiducial point is therefore the adjustment of the instrument so that the reading on the ammeter, when only the empty container is inserted, is 100 divisions. Irrespective of the experimental ensemble or manner and means of making this arbitrary adjustment, the calibration data which we have obtained are correct for the number of grams of hemoglobin for each hundred cubic centimeters of blood.

ROUTINE OF DILUTION OF BLOOD FOR USE IN THE PHOTO-ELECTRIC HEMOGLOBINOMETER

In clinical practice it has been found that the following simple technic of dilution of blood is entirely satisfactory: The blood must be laked and the resultant solution of blood (in which the hemoglobin is wholly oxyhemoglobin) must be clear. Therefore, the proteins must be kept in solution. A 0.1 per cent solution of sodium carbonate is a satisfactory diluent. To cover the range of grams of hemoglobin (extending from conditions of polycythemia to severe anemia), it has been found, after many trials, that a dilution of 1:200 was satisfactory in that such a dilution of blood afforded a sufficient range of readings on the photo-electric hemoglobinometer when absorption cells of 1 cm. thickness were used. Such a dilution can be made by adding 0.1 cc. of whole blood to 20 cc. of 0.1 per cent solution of sodium carbonate. The diluent is carefully measured with a buret and placed in a suitable container. We made use of 50 cc. lipped centrifuge tubes for this purpose. Such containers make the filling of the absorption cells an easy matter. The pipet in which the blood is drawn obviously must be accurate; we used a serologic pipet, graduated in thousandths of a cubic centimeter, drawing the blood (taken from a vein) exactly to the 0.1 cc. mark. All blood is carefully wiped from the outside of the tip of the pipet and the contents are blown at once into the solution of sodium carbonate. The pipet is washed out four or five times by drawing up and releasing the diluting fluid. The blood is laked instantly by shaking the tube for a few seconds. The solution of blood is then ready for insertion in the cleansed absorption cell, and for obtaining the reading on the scale of the micro-ammeter in the circuit containing the photo-electric hemoglobinometer.

THE SPECTROPHOTOMETRIC DETERMINATION OF HEMOGLOBIN

The various samples of blood obtained were examined spectrophotometrically with a Keuffel and Esser spectrophotometer. The solutions of blood (1:200) were placed in a containing cell of 1 cm. depth and the values of the transmission of the light at a wavelength of 540 millimicrons were obtained. From the laws of Lambert and Beer it follows that the concentrations of hemoglobin (which has the maximal point of absorption at 540 millimicrons in the beta band) are directly proportional to the negative logarithms of the unabsorbed light or

$$\frac{C_1}{C_2} = \frac{-K \log I_1}{-K \log I_2}$$

in which C represents concentration, K a constant of absorption and I the percentage of transmission of light for the wavelength 540 millimicrons.

In order to determine the value of C in grams of hemoglobin for each hundred cubic centimeters of blood and to establish the value of the absorption ratio, K, it was necessary to find the values of the concentration of hemoglobin in a given number of samples of blood by the oxygen capacity method of van Slyke. The van Slyke method, by simple calculation, gives the concentration of hemoglobin in grams for each hundred cubic centimeters of blood, with a probable error of about 1 per cent.

The curve of figure 6 was determined by taking various dilutions of samples of blood (from the same individual) which had been measured and repeatedly checked by the van Slyke apparatus and method. In obtaining the spectrophotometric data several determinations were made at wavelength 540 millimicrons on various samples of the same blood diluted, in each particular instance, to the same amount. This was done in order to eliminate as far as possible errors due to inaccuracies of dilution. A considerable number of spectrophotometric values obtained on various samples of blood, prepared and diluted as previously

V 9
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described, are plotted against values of concentration of hemoglobin for each hundred cubic centimeters of blood, as determined by the method of van Slyke. The average error is less than 2 per cent when comparison of the spectrophotometric data is made with the theoretical curve determined from data obtained by the van Slyke procedure.

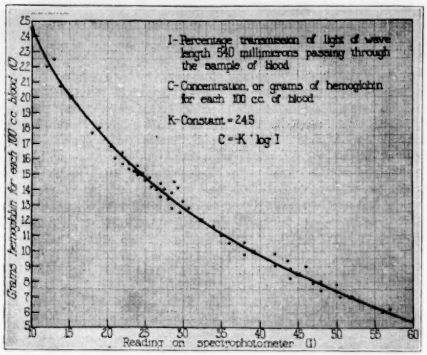
I-Percentage transmission of light of wave length 540 millimicrons passing through the sample of blood
C-Concentration, or grams of hemoglobin for each 100 cc. of blood
K-Constant = 245
C = K log I
Grams hemoglobin for each 100 cc. blood (C)
Reading on spectrophotometer (I)

Fig. 6.—Relationship between the readings on the spectrophotometer and the grams of hemoglobin determined by the van Slyke method.

The average value of the absorption ratio, when the concentration of hemoglobin is given in grams for each hundred cubic centimeters of blood, is 22.5. The average value of this absorption ratio is 0.00112 if calculations are made in terms of the amount of hemoglobin present in 1 cc. of blood diluted 1:200. This is in excellent agreement with the value of 0.00110 obtained by Davis and Sheard in 1927.

The method of choice, so far as accuracy is concerned, is the determination of the concentration of hemoglobin by the oxygen capacity of the blood after the manner described by van Slyke. One serious objection to this method is that each determination consumes considerable time, especially if check readings are made. At best, therefore, one person can make, in a day, few determinations of oxygen capacity and hence of the amount of hemoglobin in grams for each hundred cubic centimeters of blood. The spectrophotometric method, however, is comparable in accuracy to the method of van Slyke and, since it is simple and fairly rapid, it forms the basis of a satisfactory method of calibrating the photo-electric hemoglobinometer and of obtaining check readings from time to time.

CORRELATION BETWEEN GRAMS OF HEMOGLOBIN AS DETERMINED BY VAN SLYKE METHOD AND BY THE PHOTO-ELECTRIC HEMOGLOBINOMETER

The illumination (I) received by the photo-electric cell of the photo-electric hemoglobinometer is directly proportional to the current (A) set up in the circuit containing the photo-electric cell and ammeter, provided the values of the remaining portions of the electrical circuit are kept fixed. Hence

$$A = k\,I$$

in which k is a factor of proportionality. Let the van Slyke reading be indicated by V. Since the concentration (C) is directly proportional to the negative logarithm of the unabsorbed light (I) and since the current (A) in the circuit containing the photo-electric cell is directly proportional to the illumination (I) which it receives, it follows that

$$\frac{V_1}{V_2} = \frac{C_1}{C_2} = \frac{-\log I_1}{-\log I_2} = \frac{-\log A_1}{-\log A_2}$$

Figure 7 contains a curve showing the relationship between the grams of hemoglobin for each hundred cubic centimeters of blood as determined by the van Slyke method and the readings of the micro-ammeter in the circuit containing the photo-electric cell.

The points on the curve of figure 7 marked X were determined by taking samples of blood from the same individual and diluting them to various desired amounts. Several determinations of the grams of hemoglobin for 100 cc. of the original blood used were made by the van Slyke method. Readings on the ammeter of the photo-electric hemoglobinometer were made for various samples of the original blood diluted to the same percentage in order to eliminate errors due to inaccuracies of dilution. Taking the value of the van Slyke determination on the original samples of blood, it is possible to calculate the absorption ratio, or constant, K, from the equation

$$C = -K \log A$$

In a similar manner, having the dilution of various samples of the same blood (and therefore the number of grams of hemoglobin for each hundred cubic centimeters) and obtaining the readings on the ammeter of the photo-electric hemoglobinometer, it was possible to calculate other values for the absorption ratio K. These values of the absorption ratio for the various dilutions used ranged from 44.2 to 44.6, or within less than 1 per cent. The average constant, K, was

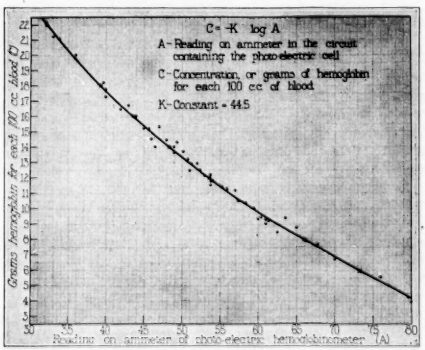
C = -K log A
A-Reading on ammeter in the circuit containing the photo-electric cell
C-Concentration, or grams of hemoglobin for each 100 cc. of blood
K-Constant = 44.5
Grams hemoglobin for each 100 cc. blood (C)
Reading on ammeter of photo-electric hemoglobinometer (A)

Fig. 7.—Relationship between the readings on the photo-electrometer and the grams of hemoglobin determined by the van Slyke method.

determined to be 44.5 when the number of grams of hemoglobin for each hundred cubic centimeters of blood is used. The correlation between various determinations by the van Slyke method and the readings on the photo-electric hemoglobinometer as referred to the curve determined from the equation $C = -K \log A$ is shown in figure 7. The average departure of those readings from the curve is about 2 per cent, with the maximal deviation of the order of 5 per cent.

APPLICABILITY OF THE PRINCIPLES OF PHOTO-ELECTROMETRY TO BIOLOGIC AND MEDICAL PROBLEMS

The principles of photo-electric photometry and the photo-electrometer may be employed in the quantitation of various substances in true or colloidal solution [8] provided such substances, when in solution, possess characteristic absorption bands, and if spectral filters, which transmit light in the region of these characteristic absorption bands, can be obtained or made. Furthermore, measurements on the turbidity of solutions can be made readily; if such solutions possess characteristic absorption spectrums the appropriate filter would be used and if no such absorption bands are present, no color filter would be employed.

We are engaged at present in the extension of the application of photo-electrometry to various types of solution and of various substances in solutions which are of pure chemical or medical significance.

RECAPITULATION

The following data have been presented in this paper:

1. A description of a modification of our original photo-electrometer used as a photo-electric hemoglobinometer, in which we have employed one stage of amplification and used a micro-ammeter for the measurement of the current in the photo-electric cell produced by the illumination from a constant source of light which passes through a selective absorptive filter and a specified dilution of blood.

2. The portability of the instrument and the accurate and rapid determination of hemoglobin expressed in grams for each hundrd cubic centimeters of blood, which recommend the photo-electric hemoglobinometer as an instrument of value in the routine examination of a large number of samples of blood and in research work.

3. Complete details regarding the modus operandi of the photo-electrometer.

4. The theoretical considerations involved in photo-electric photometry as applied to the determination of hemoglobin, indicating that the readings on the instrument follow the laws of Lambert and Beer, in that the concentration of hemoglobin, as determined by the transmission of light in an absorption zone of oxyhemoglobin (beta band), is proportional to the negative logarithm of the unabsorbed light.

5. Experimental data obtained by the van Slyke, spectrophotometer and photo-electric hemoglobinometer and their comparison together with a determination of the absorption ratios spectrophotometrically (at 540 millimicrons) and by use of the photo-electric hemoglobinometer, a selective filter transmitting light only in the region of the beta absorption band of oxyhemoglobin being used.

6. Data substantiating the belief that the photo-electric hemoglobinometer, with one stage of amplification, will permit of the determination of grams of hemoglobin for each hundred cubic centimeters of blood within an average of 2 per cent of the van Slyke values, which have been taken as standards.

7. The applicability of the principles of photo-electrometry to the determination of amounts of various unknowns in true or colloidal solutions, provided the unknown substance in solution possesses at least one characteristic absorption band for which a spectral filter, transmitting radiant energy only in the specified region, can be made.

8. Since the preparation of this paper we have found that Reimann of the Research Institute of the Lankenau Hospital, Philadelphia, has published a preliminary report on the photo-electric cell as a colorimeter. This preliminary report was made at the New York meeting of the Society for Experimental Biology and Medicine, April 21, 1926. Reimann, S. P.: The Photo-Electric Cell as a Colorimeter, Proc. Soc. Exper. Biol. & Med. **23**: 520-523, 1926.

ABSTRACT OF DISCUSSION

DR. ARTHUR H. SANFORD, Rochester, Minn.: Clinicians are now ready to think of hemoglobin in terms of grams per hundred cubic centimeters. This matter has been under discussion for several years as being the proper method of reporting hemoglobin quantities on charts rather than in percentages. We are inclined to say, "Well, that is 70 per cent; I guess that is about normal," which does not mean anything. Perhaps I should make one statement regarding why we use 6 as a factor. That is arbitrary, of course, but we have ranges of from 15 to 17 Gm. per hundred cubic centimeters as the normal amount. My suggestion is that we take 16.66 Gm. as normal, which is one sixth of a hundred, and that will give us an easy factor of 6 to use in determining an arbitrary percentage. If one wishes to speak in terms of percentages of the normal number of erythrocytes in determining color index, I would suggest that 5,000,000 be used as normal and a factor of 20. The color index formula is

$$\frac{\text{Gm. per 100 cc. of hemoglobin} \times 6}{\text{R. B. C. count in millions} \times 20}$$

DR. WILLIAM G. EXTON, New York: The offhand way in which Drs. Sheard and Sanford speak of putting different methods together might lead the uninitiated to think that it was quite an easy matter. I can certify, however, that this instrument represents a real accomplishment. From the standpoint of design, Drs. Sheard and Sanford have done an excellent piece of work, and have given us a beautiful and compact instrument which in time will meet with more and more appreciation. Improvements in photo-electric cells are going to make the principles applied in the instrument more easily workable and perhaps some day the amplification step can be omitted, which will be quite a help. In the authors' description of their hemoglobinometer as "putting together well known principles" there is another point which I think should be clarified. The spectrometric principle of measuring a color by isolating its absorption band with a light filter and then measuring the density of the absorption band is a novel one. In fact, it is the first new principle brought to colorimetry since the middle of the last century and, so far as I have been able to determine, has been applied in only one other instrument. I am delighted that Drs. Sheard and Sanford found this new spectrometric method of colorimetry adaptable for their hemoglobinometer, because I think it has a number of advantages over the older tint matching methods. The instrument that they have produced promises to be of great value.

DR. E. E. OSGOOD, Portland, Ore.: This is a fundamentally important piece of research for three reasons. First, it gives us another rapid and accurate method for hemoglobin estimation. Of the important laboratory estimations no other is so often done inaccurately. However, this method seems applicable only to the larger laboratory, because of the expense of the apparatus and its intricacy, which might require the services of an expert physicist to adjust it. Dr. Haskins and I have a method which permits hemoglobin estimations of equal accuracy done with almost equal speed and which requires no apparatus not found in the usual laboratory. A second and more important reason is that in the determination of light intensities the substitution of the more sensitive photo-electric cell for the human eye opens up vast future possibilities. One improvement has already been made, the addition of one step of amplification. Further possibilities are an adaptation of this instrument to almost any of the estimations now done with the colorimeter. However, I believe that the ultimate field for this instrument is in the research laboratory, where the greatest possible accuracy is desired. The third and most important reason is that this research demonstrates the value in medical problems of turning to the expert in other fields of knowledge. When the photo-electric cell appeared some of us thought of the possibility of substituting it for the human eye, but how many of us had the knowledge of physics to develop it as beautifully

as Drs. Sheard and Sanford have done? Medicine needs an Edison, with a knowledge of its problems and the ability to state them clearly, who has the funds and the insight to secure such expert help. The logical figure to use as 100 per cent hemoglobin in calculating color indexes is not the arbitrary figure suggested by Dr. Sanford but the hemoglobin coefficient (the grams of hemoglobin per hundred cubic centimeters of blood calculated to an erythrocyte count of 5 million) as determined in the largest series of healthy individuals of the patient's sex and age group. This has been determined by Dr. Haskins and me to be 14.7 for men and 14.3 for women. These figures should be used in calculating color indexes until a larger series of estimations gives us more accurate figures.

DR. CHARLES SHEARD, Rochester, Minn.: We have given the essential points of the method for determining hemoglobin by the photo-electrometer with one stage of amplification. Necessarily references to the work of previous investigators (which are cited in the completed manuscript) have been omitted in large part. I believe that Dr. Exton is correct in his statements. Possibly we did not emphasize sufficiently the fact that Dr. Exton claims to be the first to apply the principle of selective filters to colorimetric determinations, measuring the intensity of light through any selective filter and solution "by depth or by neutral wedge." Dr. Sanford and I are glad to accord him credit for and appreciation of his investigations. Likewise, we are mindful of the excellent work of Haskins and Osgood. As standards are developed, we may look for greater precision in medicine. With regard to the photo-electric cell and the human eye, I should hesitate to agree with the suggestion that the ordinary photo-electric cell is more sensitive than the eye. We can read a newspaper by moonlight, and we all know that the intensity of such light is low. However, the photo-electric cell, when properly operated, does not suffer from fatigue such as is experienced in varying and uncertain degree by the eye. Nor does the photo-electric cell need to form judgments of color or intensity of color and compare these with the estimation of such colors and intensities on the part of various observers. It is, in truth, a mechanical eye and reads faithfully and automatically the intensity of the light which it receives. Furthermore, in the photo-electrometer as presented here, it is possible that the photo-electric cell may deteriorate with time; the battery supplying current for operating the source of illumination may run down, but it is always possible to bring the reading of the micro-ammeter to the 100 division point by means of opening or closing the iris diaphragm. We may change the photo-electric cell, source of illumination, vacuum tube and all else, and if we can obtain by any manipulation the arbitrary 100 division reading with the empty container (for holding diluted blood) in the path of the light, we can determine accurately the percentage of hemoglobin from the chart or curve which we presented. I believe that the human eye is a marvelous optical instrument, but I am not sure that it always tells the truth and that one man's eye and judgment are comparable with those of another man. I believe that this mechanical eye will tell the truth, within the limits of accuracy which we have assigned, when used in our photo-electrometer.

Syphilis and the Third Generation.—Whether syphilis can be transmitted to the third generation has not been settled. We have evidence in our own observations that a syphilitic mother may give birth to syphilitic children over a period of twenty years or more. If syphilis can remain sufficiently active in the parent for transmission over such a length of time, it seems entirely plausible that it might do the same in the children. We have noted several instances in which the circumstances were such as to make the syphilis of the third generation most readily explainable on this basis. However, absolute proof is very difficult or altogether impossible. We have no means of excluding an acquired infection in the second generation superimposed upon an inherited one which had become latent or extinct. From the point of view of frequency, transmission to the third generation is more of theoretical than of practical interest.—Jeans, P. C.: Hereditary Syphilis, *Pennsylvania M. J.*, November, 1929.

BRUCELLA ABORTUS INFECTION IN MAN

THE INTRADERMAL REACTION AS AN AID IN DIAGNOSIS *

ALFRED S. GIORDANO, M.D.
SOUTH BEND, IND.

In a recent preliminary report [1] it was pointed out that the diagnosis of undulant fever in man is often difficult because of the indefinite clinical picture, the low percentage of positive blood cultures and the fact that the agglutination reaction is not always present. These difficulties associated with the clinical diagnosis of undulant fever have long been recognized abroad and the problem has recently been emphasized in America by Carpenter,[2] who reports that of sixty-five cases of undulant fever, five with positive blood cultures did not have any agglutinins in the serum. Kristenson [3] reports thirty-two cases of undulant fever without agglutinins. Tramontano [4] reports that there were no agglutinins in nine patients with confirmed undulant fever. My own limited experience substantiates these reports.

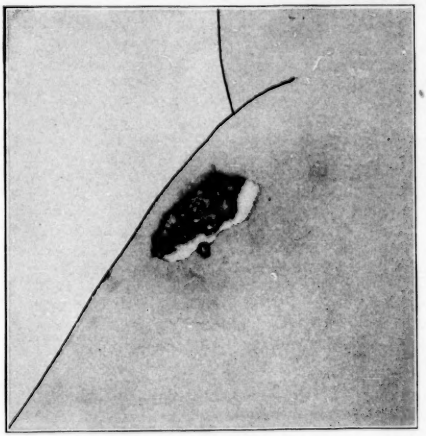

Fig. 1.—Appearance one day after intradermal injection of 0.05 cc. of Brucella abortus suspension.

In Europe, where this problem is of considerable importance, investigators have attempted to develop a skin reaction to help in the diagnosis of doubtful cases in which the blood culture and the agglutination reaction are absent. Burnet [5] first made the attempt by the use of intracutaneous broth filtrates of *Brucella abortus*, obtaining specific reactions. Similar results were

* From the South Bend Medical Laboratory.
* Read before the Section on Pathology and Physiology at the Eightieth Annual Session of the American Medical Association, Portland, Ore., July 12, 1929.

1. Giordano, A. S.: Undulant Fever, J. Indiana M. A. **22**: 135 (April) 1929.
2. Carpenter, C. M.: Personal communication to the author.
3. Kristenson, quoted by Carpenter (footnote 2).
4. Tramontano, V.: Il valore della siero agglutinazian e dell'emocultura per la diagnosi di militense, Gazz. internaz. med. chir. **30**: 226, 1925.
5. Burnet, E., quoted by Bua (footnote 8).

obtained by Trenti,[6] while Mitra [7] and Bua [8] do not regard the test as satisfactory but obtained specific skin reactions with killed salt suspensions of *Brucella melitensis*.

Early in this investigation, broth filtrates were used and found not to be of sufficient specific value. On the other hand, when salt suspensions of heat-killed *Brucella abortus* were injected, specific reactions occurred in known positive cases of undulant fever.[9]

The material included in this report consists of twenty-five proved cases of undulant fever, seventy-five tuberculous patients and twenty normal adults who served as controls. The antigen was prepared by growing a recently isolated strain of *Brucella abortus* from human source (Clark strain) on Huddleson's liver agar in an atmosphere of 10 per cent carbon dioxide for from forty-eight to seventy-two hours. The growth was suspended in salt solution to the density of 1 : 1,000

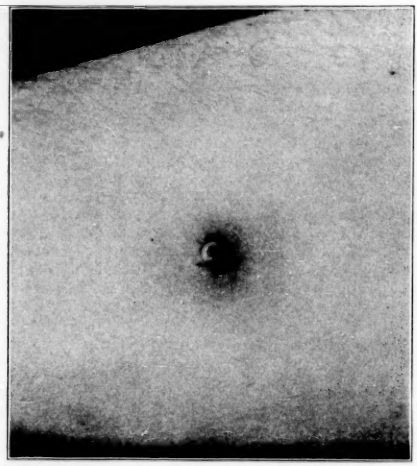

Fig. 2.—Appearance six days after injection of 0.05 cc. of Brucella abortus suspension.

U. S. P. Health Silica Standard and killed by heat. Of this suspension, 0.2 cc. was injected intradermally. (A similar study now in progress with from 0.05 cc. to 0.1 cc. of killed *Brucella abortus* suspension is yielding equally specific reactions.)

A positive reaction usually appears in from twelve to forty-eight hours and is manifested by local redness and heat (fig. 1). In the first few hours there often appears redness along the lymphatic channels, but this alarming sign disappears in a few hours. After twenty-four hours there develops, at the site of injection, an area of induration, and this may disappear in a few days or develop into a local granulomatous lesion resembling a boil with a grayish point suggesting underlying pus (fig. 2); but three of such lesions were incised and neither pus nor bacteria were found. Finally, healing takes place in from ten to thirty days, leaving a local scar with an area of discoloration which may persist for months.

All of the twenty-five proved cases of undulant fever yielded specific unmistakable reactions. The 100 control cases were first tested for the presence of *Brucella abortus* agglutinins before the intradermal inoculation, and positive reactions were not found. In the control cases the local point of inoculation varied in appearance and time of absorption. A positive reaction occurred in only one instance, and this patient was in a tuberculosis sanatorium under suspicion of probable tuberculous infection.

Subsequent agglutination reactions were made on the positive and negative groups within from a few days to three months after the skin test. In the positive group the agglutinin titer was appreciably increased and in the negative group agglutinins appeared in 70 per cent. This observation may be of importance in the consideration of vaccine therapy in undulant fever.

SUMMARY AND CONCLUSIONS

Killed suspensions of *Brucella abortus* were injected intracutaneously in twenty-five proved cases of undulant fever, producing severe local reactions by the method employed. One hundred controls similarly injected yielded negative reactions in 99 per cent.

It would seem desirable that this procedure should be carried out in all proved cases of undulant fever to determine its specificity in a larger series of cases.

604 North Main Street.

6. Trenti, E.: Il valore della intradermoreazione nell'infezione militense, Policlinico (sez. prat) **32**: 767 (June 1) 1925.
7. Mitra, M.: La intradermoreazione nella febbre Mediterranea dell'infanzia, Pediatria **32**: 721 (June 15) 1924.
8. Bua, F.: Sul metodo ed il valore dell-intradermoreazione nella militense, Minerva med. **6**: 394, 1926.
9. Sensenich, R. L., and Giordano, A. S. Brucella Abortus Infection in Man, J. A. M. A. **90**: 1782 (June 2) 1928.

UNDULANT FEVER

REPORT OF SIXTY-THREE CASES OCCURRING IN AND ABOUT DAYTON, OHIO *

WALTER M. SIMPSON, M.D.
AND
EUNICE FRAIZER, M.A.
DAYTON, OHIO

Undulant fever can no longer be regarded as an uncommon disease of man. During the past year we have conducted a clinical and pathologic investigation of the disease in and about Dayton, Ohio, with the result that sixty-three cases of undulant fever have been discovered in this circumscribed area. The literature of the past few years has brought such an abundance of evidence as to the widespread distribution of the disease, particularly in this country, that we have become acutely aware of its importance as a grave public health problem.

To Alice C. Evans, bacteriologist, United States Public Health Service, belongs the credit for having demonstrated that human beings are often infected with the organism of contagious abortion of cattle and hogs. In 1918, Evans [1] pointed out that the organism of contagious abortion in cattle and other domestic animals, the so-called bacillus of Bang, is indistinguishable morphologically, biochemically, culturally and by ordinary agglutination tests from the organism that causes

* From the Diagnostic Laboratories of the Miami Valley Hospital.
* Read before the Section on Pathology and Physiology at the Eightieth Annual Session of the American Medical Association, Portland, Ore., July 12, 1929.

1. Evans, Alice C.: Further Studies of Bacterium Abortus and Related Bacteria: II. A Comparison of Bacterium Abortus with Bacterium Bronchisepticus and with the Organism Which Causes Malta Fever, J. Infect. Dis. **22**: 580 (June) 1918.

Malta fever or goat fever, the so-called *Micrococcus melitensis* of Bruce. Pregnant guinea-pigs inoculated with either organism produced the same percentage of abortions. At this time, Evans made the prophetic suggestion that the close relationship between *Brucella abortus* and *Brucella melitensis,* an organism known to be pathogenic to man, indicated that *Brucella abortus* probably possessed similar pathogenicity for human subjects.

In 1924, Evans [2] suggested cattle as a possible source of infection of human beings, following a serologic study of 500 human serums of patients suffering from a variety of diseases. She found agglutinins specific for *B. abortus* in fifty-nine (11.8 per cent) of the 500 serums. She suggested that the agglutinins were produced as a specific response to *B. abortus* ingested in cow's milk. Furthermore, she [3] produced abortion in a pregnant heifer inoculated intravenously with *B. melitensis,* which had been recovered from the blood of a human case of undulant fever. She recovered the organism from the colostrum of the heifer and from the stomach contents, intestinal contents and the peritoneal fluid of the fetus. The recovered strain was found to be serologically identical with the strain used for inoculation. The results were typical of those which would have been expected if the inoculation had been made with a virulent strain of *B. abortus* of bovine origin. In 1927, Evans [4] collected from the literature and from her own experience twenty reports of human cases of undulant fever occuring in the United States contracted from cattle or hogs.

In 1924, Keefer [5] reported the first American case of human infection with *B. abortus.* The clinical picture was that of Malta fever, but the patient had not been in contact with goats; he was known to be a heavy consumer of raw cow's milk. An organism, identified by Evans as *B. abortus,* was recovered from blood cultures.

In 1926, Carpenter and Merriam [6] reported two cases of undulant fever in university students at Ithaca, N. Y., from whose blood Carpenter recovered *B. abortus.* Two heifers in their first pregnancy aborted after inoculation with these cultures, and the organism was recovered from the placentas and fetal organs. Carpenter suggested that milk was the probable source of infection, because the milk consumed by one of the patients was found to be heavily infested with exceptionally virulent strains of *B. abortus.* Neither patient had been in contact with goats, nor had either consumed goat's milk or cheese.

The next year, Carpenter [7] reported that in a study of ten cases of undulant fever in man he had recovered an organism indistinguishable from the organism of contagious abortion of cattle. He then inoculated five pregnant heifers which did not react to the agglutination test and which were purchased from small herds in which infectious abortion was not apparent. The five heifers aborted from five to twenty days after the culture was received. The organism was recovered from the fetus, placenta and colostrum in each case. One heifer, which was not destroyed for six and one-half months after aborting, still harbored the organism in her udder and eliminated it in large numbers in her milk.

It may be considered, then, that it has been proved beyond question of doubt that the organism which produces contagious abortion in cattle and other domestic animals is capable of producing in human beings a disease clinically, bacteriologically and serologically identical with the Mediterranean type of Malta fever caused by the ingestion of goat's milk.

In June, 1928, Sensenich and Giordano [8] reported seven cases in South Bend, Ind.; a more recent report increases the number of South Bend cases to thirty-five. In September, 1928, Kern [9] analyzed the clinical data of the thirty-six cases that had been reported by American workers up to that time and added three cases from Pennsylvania. Orr and Huddleson [10] have investigated thirty-one cases occurring in Michigan; twenty-nine of these patients drank raw milk regularly; two used both raw and pasteurized milk. The source of the milk supply was investigated in twenty-three cases; definite evidence of contagious abortion in the cattle supplying twenty-two of the patients was obtained. More recently, Giordano [11] has reported the results of agglutination reactions carried out on 1,100 human serums, which had been submitted for Widal or Wassermann reactions or for chemical analyses of the blood, from persons suffering from some illness. The serums of 100 presumably normal college students were utilized as controls. Among the entire 1,100 serums, sixty-three (5.7 per cent) showed positive agglutination for undulant fever; among the 100 control serums, four were positive.

Farbar and Mathews [12] have reported an epidemic of undulant fever among twenty-five students and one laundress at Earlham College, Richmond, Ind. Because of the fact that the patients and their milk supply were limited to a college campus, it was possible to demonstrate the relationship between the human infection and that of the college herd. The first four cases were diagnosed as typhoid, influenza or malaria. Because of a history of contact with a rabbit in the fifth case, a specimen of blood was submitted to Francis, who as a routine tests all such specimens against *Bacterium tularense, B. abortus* and *B. melitensis.* He found agglutination of *B. abortus* in a titer of 1:2,560 and established the true nature of the epidemic infection as undulant fever. Of the twenty-six cases in which a clinical diagnosis of undulant fever was made, fourteen showed positive agglutination, six gave negative results with a single specimen, while six were not tested serologically. Of the twenty-three cows of the dairy herd, seven gave positive agglutination reactions for infectious abortion. *B. abortus* was recovered from the milk of three reactors, two of which were found to have advanced mastitis. The cows had never been in contact with goats or breeding pigs. All of the human victims of the infection were consumers of raw milk or cream from this herd. The institution of pasteurization terminated the epidemic.

2. Evans, Alice C.: Malta Fever: Cattle Suggested as a Possible Source of Infection, Following a Serological Study of Human Serums, Pub. Health Rep. **39:** 501 (March 14) 1924.
3. Evans, Alice C.: Experimental Abortion in a Cow Produced by Inoculation with Bacterium Melitensis, Pub. Health Rep. **38:** 825 (April 20) 1923.
4. Evans, Alice C.: Human Infections with Organisms of Contagious Abortion of Cattle and Hogs, J. A. M. A. **88:** 630 (Feb. 26) 1927.
5. Keefer, C. F.: Report of a Case of Malta Fever Originating in Baltimore, Maryland, Bull. Johns Hopkins Hosp. **35:** 6-14 (Jan.) 1924.
6. Carpenter, C. M., and Merriam, H. E.: Undulant Fever from Brucella Abortus: Report of Two Cases, J. A. M. A. **87:** 1269 (Oct. 16) 1926.
7. Carpenter, C. M.: Results of Injecting Pregnant Heifers with Brucella Abortus Isolated from Man, J. A. Vet. M. A. **70:** 459 (Jan.) 1927.
8. Sensenich, R. L., and Giordano, A. S.: Brucella Abortus Infection in Man: Report of Seven Cases, J. A. M. A. **90:** 1782 (June 2) 1928.
9. Kern, R. A.: The Clinical Aspects of Brucella Melitensis Var. Abortus Infection in Man, Am. J. M. Sc. **176:** 405 (Sept.) 1928.
10. Orr, P. F., and Huddleson, I. F.: A Further Epidemiological Study of Undulant Fever in Michigan, Am. Pub. Health A., 1929, pp. 34-38.
11. Giordano, A. S., and Ableson, M.: Brucella Abortus Infection in Man: A Serologic Study, J. A. M. A. **92:** 198 (Jan. 19) 1929.
12. Farbar, M. E., and Mathews, F. P.: An Epidemic of Undulant Fever, Ann. Int. Med. **2:** 875 (March) 1929.

Hardy [13] deserves great credit for his indefatigable and eminently successful efforts to demonstrate the high incidence of undulant fever in Iowa. In a little more than one year he investigated 125 cases, all of which showed an agglutinin titer above 1:80 and the organism was recovered in blood cultures of twenty-two patients. There were four fatalities in Hardy's series of cases.

The experiences of Evans, Carpenter, Huddleson, Giordano, Hardy and our own prove that the disease is invariably found to be prevalent when one makes a concentrated investigation of the incidence of the disease in a given locality.

The name "undulant fever," originally proposed by Capt. M. L. Hughes of the British Army Medical Staff, in 1897, was recommended by the International Congress of Medicine held in London in 1913 to replace the geographic designation Malta or Mediterranean fever. In view of the wide dissemination of this disease and the obvious geographic limitations indicated by the term Malta fever, the members of the "Camera Medica" of the island of Malta and the Malta branch of the British Medical Association have urged that the term "undulant fever" be adopted for the disease of man.

The term "infectious abortion of cattle" leaves much to be desired because it is a well known fact that the disease affects bulls as well as nonpregnant cows; many pregnant cows harbor the infection but do not abort. The disease is widely prevalent among cattle in this country. It has been stated [9] that 90 per cent of the herds of Connecticut are infected. In Pennsylvania less than 14 per cent of herds are free from infection.[9] Carpenter and Baker [14] report that the milk from nine of fifty herds supplying milk to the city of Ithaca, N. Y., showed abortus infection; 60 per cent of the cows in one herd were eliminating the organism in the milk. Fleischner and Meyer,[15] after inoculating guinea-pigs with certified milk, conclude that "*Brucella abortus* is, for all practical purposes, always present in the certified milk produced in the San Francisco Bay regions." Our own experience leads us to believe that infectious abortion of cattle is even more common in southern Ohio. Of sixty-three cattle, including four calves and three bulls, in five herds which supplied milk to ten of the patients in the Dayton series, all but the four calves were found by us to give positive serologic evidence of *B. abortus* infection. Five of the cows were found to be eliminating *B. abortus* in large numbers in their milk.

SOURCES OF INFECTION

Until a relatively short time ago, it was not known that *B. abortus* was pathogenic for man. Although the disease is most common in cattle, it is known that sheep, hogs, mules, asses and dogs harbor the infection. A thorough investigation of the probable sources of infection in the Dayton series of cases of undulant fever indicates that in every instance in which a causal relationship could be established the disease occurred in those persons who drank raw milk or ate unpasteurized dairy products. We did not encounter any cases of direct porcine or caprine origin. Four strains of *B. abortus* recovered by us (one from human blood, three from cow's milk) were found by Huddleson to be of the bovine variety. Our experience does not lend any support to the belief expressed by Blake and Oard [16] and others that the porcine rather than the bovine variety of *B. abortus* is the usual cause of undulant fever in this country, even though one cannot deny the possibility of transmission of the porcine strain to cows and thence to man.

Schroeder and Cotton [17] found *B. abortus* in the milk of 83.5 per cent of cows whose serum showed specific agglutinins for this organism. Carpenter [18] isolated *B. abortus* from the milk of 66 per cent of a group of cows that either had aborted or had retained the placenta at least once during three previous gestation periods; the organism was recovered from the milk of three cows whose serums did not show any agglutination.

Carpenter and King [19] conducted an extensive survey of the raw milk supplied to sixty-seven small towns, two small cities and one city of 200,000; *B. abortus* was found in 20.4 per cent of the samples examined. The raw milk supplied to these towns and cities was produced by herds found to be extensively infected with *B. abortus*.

While the great majority of cases of undulant fever have resulted from the ingestion of unpasteurized milk and dairy products, the disease also affects packing house workers, meat handlers, farmers and veterinarians as a result of direct contact with animal tissues infected with *B. abortus*.

CLINICAL MANIFESTATIONS IN MAN

Undulant fever in man is frequently confused with four common diseases: typhoid, malaria, tuberculosis and influenza. Less commonly it has been mistaken for rheumatic fever or for subacute bacterial (*Streptococcus viridans*) endocarditis. In many cases it is only after repeated negative Widal reactions, the failure to find the plasmodium of malaria and the inability to elicit physical signs or roentgenographic evidence of tuberculosis that the possibility of undulant fever is considered.

It has been repeatedly stated that undulant fever does not produce any well defined clinical picture, and that the clinician must look to the laboratorian for the diagnosis. Our experience has not been in accord with this widely accepted belief. In more than one third of the cases which we have studied, Dayton physicians made an initial clinical diagnosis of undulant fever and have sought our assistance only to confirm their clinical diagnoses. As soon as local physicians became familiar with the characteristics of the disease, after the first cases were presented at local medical meetings, the finding of a large group of cases rapidly followed.

In our experience, the two sexes were affected about equally, thirty-three females and thirty males. Six of our patients were in the first decade of life; eight were between 11 and 20 years of age; nineteen were between 21 and 30; twenty were between 31 and 40; four were between 41 and 50; six were over 50. Twenty-two were housewives, nine were farmers or dairymen, seven were students, while the remainder were engaged in nonagricultural pursuits. It is noteworthy that more

13. Hardy, A. V.: Undulant Fever: A Clinical Analysis of One Hundred and Twenty-Five Cases, J. A. M. A. **92**: 853 (March 16) 1929.
14. Carpenter, C. M., and Baker, D. W.: Cornell Vet. **17**: 236 (July) 1927.
15. Fleischner, E. C., and Meyer, K. F.: Presence of Bacillus Abortus-Bovinus in Certified Milk, Am. J. Dis. Child. **14**: 157 (Sept.) 1917.
16. Blake, F. G., and Oard, H. C.: Undulant Fever: A Report of Three Cases Occurring in Connecticut, Yale J. Biol. & Med. **1**: 128 (Jan.) 1929.
17. Schroeder, E. C., and Cotton, W. E.: An Undescribed Pathogenic Bacterium in Milk, Proc. Am. Vet. M. A., 1911, p. 442; The Bacillus of Infectious Abortion Found in Milk, 28th Ann. Rep. Bureau Animal Indust., U. S. Dept. Agriculture, 1911, pp. 139-146.
18. Carpenter, C. M.: Brucella Abortus in Udders of Vaccinated and Naturally Infected Cattle, Cornell Vet. **16**: 133, 1926.
19. Carpenter, C. M., and King, M. J.: Brucella Abortus in Milk and Its Relation to Undulant Fever, Am. Pub. Health A., 1929, pp. 1-11.

than one member of six families was affected. The relative immunity of children appears to parallel the immunity of calves.

The disease pursues a variable course and is of irregular duration. The incubation period has not been well established because of the difficulty in knowing exactly when the infection occurred. It has been stated to vary from six to fourteen days.

The prodromal symptoms are vague and present nothing of a characteristic nature. The early signs are usually those of a mild general infection. The most common initial complaints are fever, chills and sweating, associated with weakness. The patient becomes vaguely aware of an afternoon or evening rise in temperature, associated with headache and pains in the muscles, joints, back and extremities. The elevation of temperature is frequently associated with chills followed by sweats. The perspiration may be of a drenching character and is usually nocturnal. The sweat has a peculiar sweetish, fetid odor. In many instances the patient is not incapacitated by his illness and his general appearance belies the objective clinical observations. Often the patient has not presented a febrile appearance and the physician has been amazed to find a temperature between 102 to 103 F. The mental state remains clear; the so-called typhoidal state was not observed in any of our cases.

In most instances the fever follows a somewhat characteristic course, with remissions or intermissions in the morning and elevation in the afternoon or evening. The fever occasionally reaches 105 or 106. The average maximum height in our series of cases was 103. The pulse rate is usually disproportionately slow during the elevations of temperature. These matutinal remissions and nocturnal exacerbations of fever last from one week to several months, the average duration of the illness in our experience being about three months. Relapses occasionally occur a few weeks or months following apparent recovery. Undulating febrile waves were not common, having appeared in only seven of our cases. In many cases the disease has persisted for several years. In one case there is convincing evidence to indicate that the disease has recurred at irregular intervals for eight years. Loss of body weight is an almost constant finding; many patients lose from 25 to 50 pounds (11 to 23 Kg.). There seems to be a direct relationship between the height of the fever, the drenching character of the sweats and the loss of weight. In those persons who have experienced excessive perspiration night after night for several weeks the loss has been greatest. Headache and dizziness, restlessness and insomnia usually accompany the nocturnal febrile exacerbations. The tongue becomes coated with a yellowish fur, the breath is frequently fetid, and many complain of a disagreeable taste. Constipation appears to be the outstanding gastro-intestinal complaint.

In about 10 per cent (seven) of the cases studied, joint symptoms were the principal feature of the disease and in three instances led to an initial diagnosis of acute rheumatic fever. The usual complaint is that of migrating pain and tenderness of the larger joints; occasionally actual hydrarthrosis occurs. The organism has been recovered from the serous exudate aspirated from the joints. No permanent impairment of the joints was observed.

Abdominal pain occurred in eleven of our cases. Its location was in the epigastrium in four instances, in the right upper quadrant of the abdomen in four, and in the right lower quadrant in three. In three cases of sudden pain in the right lower quadrant of the abdomen, with fever, an appendectomy was performed. In one a gangrenous appendix was found; in the other two a normal appendix was removed. In the latter cases the surgeons requested the agglutination test for undulant fever after operation in an effort to find the real cause of the abdominal pain. After the reaction to the agglutination test was found to be positive, a typical history of undulant fever was elicited in both cases. In one case, cholecystectomy was seriously considered because of sharp pain in the upper right quadrant of the abdomen, associated with fever, chills and sweats.

Two of the features of *B. abortus* infections of cattle are abortion in the cow and seminal vesiculitis in the bull. We have encountered five cases in which women who have repeatedly aborted, and who did not present any evidence of syphilis, gave serologic evidence of previous infection with *B. abortus*; the agglutinin titers ranged from 1:80 to 1:320. Four of the five women gave histories of a febrile illness, the nature of which was not determined, at intervals from three to six years previously. All had been consumers of raw milk.

Three of our male patients went first to genito-urinary surgeons for the treatment of seminal vesiculitis, prostatitis, epididymitis and orchitis. All three denied exposure to gonococcal infection, and repeated smears made from urethral discharges after prostatic massage did not reveal gram-negative diplococci. The blood serum of the three men was found to agglutinate *B. abortus* in dilutions from 1:160 to 1:640. *B. abortus* was recovered in one case from a draining sinus tract which extended from the globus major of the epididymis through the scrotal wall. Two of the men were constant consumers of raw milk; the third drank raw milk occasionally and used unpasteurized country butter at his home.

A skin eruption has been observed in about 5 per cent of cases, usually taking the form of red, macular, scaling lesions. These may appear on the abdomen and simulate the roseola of typhoid. Further to confuse the physical observations in undulant fever with those of typhoid, the spleen is frequently palpable.

The clinical observations of the blood are usually those of a mild secondary anemia, the red blood cells averaging about four million per cubic millimeter, the hemoglobin from 70 to 80 per cent. Leukocytosis is uncommon. Leukopenia (from 4,000 to 6,000) occurred in three fourths of the Dayton cases during the acute course of the disease; in the remainder the white blood cell count was essentially normal. The differential leukocyte count usually shows a reduction in the number of polymorphonuclear neutrophils and a relative lymphocytosis, in some cases as high as 50 per cent.

The urinary observations present nothing of a characteristic nature, a trace of albumin being the most constant finding.

Even though undulant fever is decidedly incapacitating for a long period in most cases, death is relatively uncommon. One death occurred in our series. Various writers give the death rate as from 2 to 5 per cent. Ten fatalities have been recorded in American literature.

This recitation of the clinical features of undulant fever indicates the ease with which it may be confused with the diseases mentioned previously. In four of our cases a tentative clinical diagnosis of pulmonary

tuberculosis had been made because of the recurring afternoon and evening fever, fatigue and loss of weight. Three of the patients were in a local tuberculosis sanatorium. In all cases in which it is impossible to establish the etiology in cases of protracted febrile disease, undulant fever must be considered.

DIAGNOSIS

The most important consideration in the diagnosis is to include undulant fever in the differential diagnosis of all cases of continued fever, particularly in those cases in which the diagnostic criteria for typhoid, malaria, influenza, tuberculosis, subacute bacterial endocarditis and rheumatic fever are not convincing. This consideration assumes greatest importance in cases of so-called fever of unexplained etiology. The simplest and best method for the confirmation of a clinical diagnosis of undulant fever is to submit 4 or 5 cc. of the patient's blood, collected exactly as for the Wassermann reaction, to a laboratory that is equipped with the proper *B. abortus* and *B. melitensis* antigens. This blood should be collected some time during the second week of illness, since it is unlikely that agglutinins develop during the first week. In most cases the agglutinin titer rises to variable heights during the acute course of the disease and tends to fall during the afebrile periods. In one of our cases, positive agglutination was obtained in a dilution of 1:20,480 in the fourth week of illness. In most cases an agglutination in dilutions of 1:160 to 1:1,280 will be found during the third or fourth week of illness. One Dayton man acquired undulant fever at Earlham College, at Richmond, Ind., in February, 1928, at which time the agglutinin titer was found by Francis to be 1:640; a specimen collected, Feb. 17, 1929, was found by us to agglutinate *B. abortus* and *B. melitensis* in all dilutions to 1:640; in other words, there had not been any change in the agglutinin titer over a period of one year. There is abundant evidence to indicate that in many cases agglutinins remain in the serum for many months or years after apparent recovery, while in other cases the agglutinins entirely disappear a few months after recovery.

The presence of antiabortus agglutinins in low titer does not necessarily mean that the patient is suffering from active manifestations of undulant fever at the time of the test; the patient may be suffering from some other disease and the simultaneous presence of antiabortus agglutinins may represent merely the residual titer of a previous mild or severe attack of undulant fever—months or years prior to the present illness.

It would appear that the height of the agglutinin titer bears some relation to the prognosis, since the recovery has been most rapid in those cases in which the agglutinin titer has been very high.

Evans considers that agglutination in low dilutions (1:10, 1:20) is suggestive and should receive further study. There are several cases on record (Carpenter, Evans) in which *B. abortus* has been isolated from the blood of persons suffering from a febrile illness, whose serum did not show any anti-abortus agglutinins. For practical purposes we have considered that agglutination in titers of 1:80 or above, or the recovery of the organism from the blood or urine, constitutes positive evidence of present or previous existence of undulant fever. In those cases in which the clinical picture of the disease is well defined, complete agglutination in titers of from 1:10 to 1:40 should be regarded as highly significant and further bacteriologic and serologic studies should be carried out.

One possible source of error in the agglutination reactions is the occasional cross-agglutination of *B. abortus* and *B. tularense* in patients suffering from either undulant fever or tularemia. In the course of an investigation of sixty-four cases of tularemia, one of us [20] found three instances in which this cross-agglutination of *B. abortus* and *B. tularense* occurred. In these cases the relatively higher titer with *B. tularense* and the typical clinical history of tularemia left little doubt as to the proper interpretation of the serologic observations. Francis and Evans [21] suggested that serums from suspected cases of tularemia or undulant fever should be tested for agglutination with both *B. tularense* and *B. abortus* unless the clinical history points definitely to a recognized source of infection for tularemia or undulant fever. In one case of undulant fever, *B. abortus* and *B. melitensis* were agglutinated by the patient's serum in all dilutions to 1:1,280, while *B. tularense* was agglutinated in all dilutions to 1:320. Because of the higher agglutinin titer with *B. abortus* and *B. melitensis* and because of the absence of any history or physical symptoms of tularemia, the diagnosis of undulant fever was made. If it is found that the serum agglutinates both *B. tularense* and *B. abortus* antigens to the same or nearly the same titer, agglutinin absorption tests may be used to eliminate one or the other.

In view of the fact that there are occasional cases of undulant fever in which serum agglutinins do not develop, there appears to be a need for a more delicate test to supplement the agglutination reaction. The intradermal test appears to hold considerable promise. Burnet [22] found that the intradermal test with *B. abortus* broth filtrate was positive in from 15 to 20 per cent of human cases of undulant fever in which the agglutination reactions were negative. Schoenholz and Meyer [23] have prepared a purified abortin for this purpose. Giordano is enthusiastic over the possibilities of the intracutaneous injection of a suspension of heat-killed organisms as a diagnostic aid. In ten of the Dayton cases in which antiabortus agglutinins were present in titers ranging from 1:320 to 1:1,280, positive tests were obtained after the intradermal injection of 0.1 cc. of a suspension of killed *B. abortus* organisms. Twenty-five patients suffering from a variety of other diseases gave entirely negative results. The suspension was adjusted by the silica turbidity standard used in the preparation of antigen for agglutination tests. Further investigations of the skin test will be made by us.

Another method for confirming the clinical diagnosis is by isolation of the organism from the blood or urine. Blood for culture should be taken at the peak of one of the pyrexial waves. It is best to collect 15 cc. of blood and place it at once in flasks containing 30 cc. of infusion broth, the amount of inoculum in each flask being varied from 0.5 to 2 cc. per flask. Subcultures should be made from the fourth to the tenth day on beef liver infusion agar or dextrose agar, incubated in

20. Simpson, W. M.: Tularemia (Francis' Disease): A Clinical and Pathological Study of Forty-Eight Nonfatal Cases and One Rapidly Fatal Case, with Autopsy, Occurring in Dayton, Ohio, Ann. Int. Med. **1**: 1007-1060 (June) 1928; Tularemia, New York, Paul B. Hoeber, Inc., 1929.

21. Francis, Edward; and Evans, Alice C.: Agglutination, Cross-Agglutination, and Agglutinin Absorption in Tularemia, Pub. Health Rep. **41**: 1273-1295 (June 25) 1926.

22. Burnet: Diagnostic de la fièvre Méditerranée par intradermoreaction: Action du filtrat de culture du M. melitensis, Arch. d'Inst. Pasteur de l'Afrique du Nord **2**: 187, 1922; Essais de diagnostic de l'infection a M. melitensis chez la chèvre par inoculation de molitine, Arch. de l'Inst. Pasteur de Tunis **13**: 1, 1924.

23. Schoenholz, P., and Meyer, K. F.: The Purification of Abortin, J. Infect. Dis. **40**: 453 (March) 1927.

a partial anaerobic chamber containing about 10 per cent carbon dioxide. If *B. abortus* is present in the broth, small "dew-drop" colonies will appear on the agar slants in two or three days. The specimen of urine should be collected through a sterile catheter. It is best to collect daily specimens over a considerable period. There is not the same likelihood of recovery of the organism from the blood as in many other bacteremias. The organism was recovered from the blood in five of the Dayton cases.

Laboratories to which serums are sent for Widal reactions have an unusual opportunity to assist physicians in establishing a diagnosis in cases of unexplained fever. If it is made an established routine to test serums for antiabortus or antimelitensis agglutinins in all cases in which the Widal reaction is negative, many cases of undulant fever will be discovered. This practice was introduced into this laboratory two years ago, and ten cases of undulant fever have been discovered in this way. Hardy [24] discovered thirty positive cases of undulant fever in three months by trying the agglutination reactions with *B. abortus* and *B. melitensis* antigens on those serums in which the Widal test was negative. Hull and Black [25] found positive agglutination reactions with *B. abortus* antigen at dilutions of 1:200 or greater in five of sixty-nine specimens of blood from febrile patients who constantly gave negative Widal reactions.

Carpenter and King [19] have recently shown that the serum of 530 persons known to have drunk raw milk containing *B. abortus* from a single herd in which 54.6 per cent of the animals were infected showed 13 per cent to contain agglutinins specific for this organism. Eight persons from this group were exhibiting definite symptoms of undulant fever at the time the examinations were made, while others gave a suggestive history of previous infection. On the other hand, the serums from a group of 690 persons known to have drunk raw milk free from abortus infection or milk carefully pasteurized did not show any agglutinins, nor have any cases of undulant fever occurred in this group.

More than half of the series of cases reported here occurred in villages and small towns near Dayton, where pasteurization is not practiced. Such cases are usually seen first by the general practitioner; it is most important, therefore, that he become aware of the characteristics of this disease.

TREATMENT

The most important factor in the treatment of undulant fever is prophylaxis. The causative organism is destroyed by the pasteurization of milk. Carpenter found that human and bovine strains of the organism are destroyed by an exposure to a temperature of 140 F. (60 C.) for fifteen minutes; the porcine strain was more resistant, requiring an exposure of twenty minutes at this temperature. In view of the widespread incidence of infectious abortion of cattle and the presence of *B. abortus* in milk, another argument exists for the universal pasteurization of milk and other dairy products.

The treatment of the disease is essentially symptomatic. Mercurochrome has been given intravenously to twenty-three patients. Its effect has been regarded as favorable in sixteen cases and doubtful or useless in the remaining cases. Acriflavine has been used rather extensively by the French; the American cases in which it has been tried lead one to expect little favorable effect from its use. Huddleson treated infected cows with intravenous injections of large doses of acriflavine and proflavine with negative results.

We have utilized a vaccine made of killed abortus organisms (2 billion per cubic centimeter) in twenty-nine cases with apparently favorable results; in these cases the first two or three injections were followed by a rise in temperature and an exacerbation of symptoms, suggesting a protein reaction. Typhoid vaccine was used as a control in six other cases, with more marked elevation of temperature following the injections, but in these cases the temperature did not return to normal as rapidly as it did with the abortus vaccine. The remissions and recurrences that characterize undulant fever render it difficult to evaluate properly any therapeutic measure. Further investigations of the efficacy of the abortus vaccine with control studies will be carried out before any definite conclusions are reached.

SUMMARY AND CONCLUSIONS

1. Sixty-three cases of undulant fever have been discovered in and about Dayton, Ohio, during the past year.

2. The rapidly increasing number of reported cases in the United States indicates the seriousness of this disease as a public health problem.

3. Contrary to previously expressed beliefs as to the difficulties encountered in making a clinical diagnosis of undulant fever, the clinical picture of the disease was sufficiently characteristic to enable several physicians to make an initial diagnosis of undulant fever in more than one third of our cases.

4. There appears to be no etiologic factor other than the ingestion of raw milk and unpasteurized dairy products in the cases studied. No cases of direct porcine or caprine origin were encountered.

5. *Brucella abortus* was recovered from the blood of five patients suffering acutely from the disease. The organisms were found to be serologically identical with the strains recovered from the milk of five cows supplying raw milk to these patients.

6. The blood serum of five women who had aborted repeatedly was found to agglutinate *B. abortus* and *B. melitensis* in high titers. All were raw milk consumers.

7. In three human cases of suppurating seminal vesiculitis, prostatitis, epididymitis and orchitis, antiabortus agglutinins were present in high titer. The organism was recovered from a draining sinus tract of the scrotum in one case.

8. The intradermal test utilizing a suspension of killed *abortus* organisms seems to hold considerable promise as an adjunct to the agglutination test.

ABSTRACT OF DISCUSSION

ON PAPERS OF DR. A. S. GIORDANO AND OF DR. W. M. SIMPSON AND EUNICE FRAIZER

DR. R. L. SENSENICH, South Bend, Ind.: Undulant fever has been overlooked, probably by reason of the fact that those who were interested were searching for a condition similar to that described as malta fever. Cases were not recognized. This was a logical development of Alice Evans' work, in which she called attention to the uniform character, from a bacteriologic standpoint, of *Brucella abortus* and *Brucella melitensis*. Dr. Giordano and I reported eight cases observed in 1927. At that time, the first case we had followed closely showed the undulant puerperal course described in Malta fever. Following the first case, when we had begun to observe and had undulant

24. Hardy, A. V.: Malta Fever: A Problem for State and Municipal Laboratories, Pub. Health Rep. **43**: 503 (March 2) 1928.
25. Hull, T. G., and Black, L. A.: Undulant Fever as a Public Health Problem, J. A. M. A. **88**: 463 (Feb. 12) 1927.

fever in mind, we found, much to our surprise, that these cases showed such a widely varying course that no more cases exhibited this undulant type of fever. This brought to mind the fact that perhaps the disease due to *Brucella abortus* might tend to a course which was in some respects, at least, unlike the classic description. This proved to be the case. The second case we had under observation was one in which we ultimately obtained a history covering a considerable period of time, in which there was a recurrent hypo-arthrosis, a typical condition which recurred at definite intervals for a long time. The next case was of a particularly neurologic character. I should like to emphasize, as Simpson and Fraizer have done, the fact that while in many of the milder and more atypical cases the diagnosis could not be made without the assistance of various laboratory procedures in a goodly proportion of cases, at least, the condition might be diagnosed clinically. I believe Dr. Hardy noted what seemed to be an occupational connection. We did not have such a connection in our cases. We did not note any difference between males and females. Dr. Giordano's test has given uniformly dependable results.

DR. A. V. HARDY, Iowa City: There is one addition I should like to make to Simpson and Fraizer's paper. In Keefer's case report, in discussing the probable source of infection, we note that he pointed out that the patient used raw milk extensively. It was easy to assume that he acquired his infection from cattle through ingesting raw milk. It has recently been pointed out, however, that this man was a laboratory worker, employed by the anatomy department. At the time he became ill, one of his particular tasks was to go to a packing house and obtain hog embryos for study. We know from our knowledge of the localization of the infection in hogs that the handling of hog embryos would be a ready means of acquiring the infection. Further, the probability of the infection coming from hogs rather than from cattle has been borne out by the typing of the organism isolated in this case, which was found to be of the porcine type. It is easy to assume that all of these infections do come from cattle, but we may fall into error unless we adopt a conservative attitude and consider carefully every other possible source. It is interesting that Simpson and Fraizer have observed the cases of abortion in infected women. I believe this to be a particularly valuable addition to our knowledge. The infection in cattle is called contagious or infectious abortion. This is a misleading name. Abortion is only one of the signs of *Brucella melitensis* infection in animals and not a constant one. Retained after-births, sterility and the death of calves shortly following birth are also signs. In attempting to detect probable sources of infection in animals, we must therefore ask regarding these conditions as well as abortion. I am glad, also, that the skin test has been presented today. Whether it will prove a valuable diagnostic test has yet to be determined. I understood that up to the present the test has been used largely in cases which showed positive agglutination tests. Its value will depend on whether it is positive in infected cases which do not show the agglutinin reaction, and this is something to which we must give attention. This test may prove to be valuable also in giving us some knowledge of either the natural or the acquired immunity, which must be very common.

DR. H. E. HASSELTINE, Washington, D. C.: I have been assigned to the field study of undulant fever in the whole of the United States. I have visited eight or ten different states in the past four months and have seen the disease under the varying conditions of the different sections. In each section there seems to be a peculiarity, and yet there is a uniformity which makes it apparent that we are dealing with the same disease all over the United States. Simpson and Fraizer gave an excellent description of the clinical aspects of the disease. They have led us to believe that the disease is not readily recognized, and with that point I agree. But there is one thing which I want to emphasize which will point our suspicions in the right direction. If one finds a patient suffering from what appears to be a low fever, with general malaise, one is likely to find that his temperature is far in excess of what was anticipated, judging from his general appearance, provided he has true undulant fever. Furthermore, if one has trouble with his wanting to go to work in the morning against advice and if, in case he does go, between 12 and 3 in the afternoon he usually goes home and goes to bed with an "all-in" feeling, one should strongly suspect that he is suffering from undulant fever. I know of no condition in which the apparent well being of the patient contrasts so markedly with the record of the thermometer. It is directly the opposite of the usual typhoid picture. I do not want to give the impression that this follows in all cases. There are a few severe cases which do simulate typhoid in the degree of prostration, but the average patient seems far better than the thermometer indicates. I congratulate Simpson and Fraizer on their success in isolating the organism of undulant fever from patients and from the animals which were the source of the infection in their cases. I want to stress the value of the blood culture as the best means of diagnosis. When *Brucella* is obtained from the blood stream, the last argument will be answered as to the diagnosis. It is true that a positive blood culture is not easy to get, and many, I fear, have given up too soon. It takes some of these organisms a long time to grow. Simpson and Fraizer reported some cases exhibiting abdominal pain. I have found several patients, in my field studies, who have given that as an initial sign, and some have barely escaped laparotomy. I think a blood count should be done before the abdomen is opened. A leukopenia with a relative high lymphocyte count should suggest undulant fever instead of a surgical condition. I am glad to hear about Dr. Giordano's success with the skin test. I feel that it may be of value, especially in those cases in which the agglutination test is negative or so low that it is doubtful.

DR. FITCH C. E. MATTISON, Pasadena, Calif.: I have enjoyed both papers very much, and the suggestion of the skin test is a valuable one. I have been interested more in the preventive side than anything else, as I happen to be chairman of the Certified Milk Commission of Los Angeles County. We were warned about two or three years ago, by Dr. Karl Meyer of the Hooper Foundation for Medical Research, that some preventive measures should be used not only in public health work to prevent infection but in preventive medicine in the cleaning up of herds for *Brucella abortus*. Two years ago we started to test all the cattle in certified herds in California by the agglutination test and segregation. At present there are no cows under certification in the state of California that are not absolutely free from the agglutination reaction. Dr. Simpson suggested in another discussion that we must pasteurize certified milk. I cannot agree with him, because if certified milk has been properly produced, from cows that are absolutely negative to the agglutination test, one is perfectly safe in using the milk.

DR. WALTER L. BIERRING, Des Moines, Iowa: In attempting to correlate certain clinical signs with pathologic changes, we recognize the gaps that still exist in our knowledge of this subject. The enlarged spleen is probably a feature of the general septicemia. While changes have been noted in the lymphoid structures of the intestinal tract, they are not constant and do not necessarily signify that the digestive tract is the portal of entry. The onset of myasthenia, severe muscular pain and rigidity followed by marked atrophy suggest a primary myositis and degenerative changes that are worthy of further study. The protean character of this infection is generally recognized. This naturally directs attention to the possibility of mild or abortive types which at present evidently escape observation. While efforts have been made to correlate the titer or degree of agglutination with the severity of the disease, as yet no definite conclusions are possible. It will be interesting to have careful comparisons made between the skin tests and the agglutination titer. There is still much that is obscure in regard to the source of the infection. In Iowa we are inclined to regard the porcine origin and contact infection as the more common, but the raising of hogs is one of Iowa's leading industries and that may influence our conclusions. Continued careful observation and the proper diffusion of further knowledge of the disease will greatly advance scientific interest and soon lead to its more effective control.

DR. L. NAPOLEON BOSTON, Philadelphia: I should like to mention three cases which occurred in Philadelphia. One patient developed tuberculosis later and died from it. Two

cases developed in a club house outside of Philadelphia within one month after the club had started using whole milk instead of pasteurized. As to the possibility of rodents being a source of infection, I have been watching this carefully, and question whether rodents do not convey this disease to cattle. I should like to ask whether the author will not get *Bacterium tularense* and make the agglutination test as a check up. It has been accomplished by us, but not in enough cases to justify any definite statement. Regarding Dr. Giordano's skin test or reaction, I am glad he has revived it.

DR. WALTER M. SIMPSON, Dayton, Ohio: The question was raised as to whether the skin test might be superior to the agglutination test. I think it would be erroneous even to suggest that the skin test alone would be superior to the agglutination test. The agglutination test is by all means the best diagnostic procedure we have at hand, but better still is a combination of three procedures: (1) the recovery of the organism from the blood or urine; (2) agglutination, and (3) the skin test. The skin test should be regarded merely as a supplementary test and will be of greatest value in those occasional cases in which the agglutination reactions are negative. The inability to recover the organism from the blood is usually due to the failure to collect a sufficient amount of blood. It would appear that the addition of citrate to the blood is deleterious. I would suggest that from 15 to 20 cc. of blood be collected, placed directly in flasks of broth, with subsequent transfers to a variety of mediums, and subjected to both aerobic and anaerobic conditions, with varying degrees of carbon dioxide tension. It seems to me that our great problem is to find this organism in the blood of human beings and establish its identity with the organisms recovered from animal sources. In regard to Dr. Mattison's statement that they are now perfectly safe in California because the cows that produce certified milk show no antiabortus agglutinins, I should like to emphasize that some cows that eliminate the organisms in large numbers in their milk do not show any antiabortus agglutinins, so that a negative agglutination test does not mean that the cow is free from the infection. Nevertheless, I believe that the agglutination test is the best guide that veterinarians possess. This movement to eliminate the infection at its source in California is highly commendable. Even though resolutions may have been passed at Montreal, they have not yet been put into practice in many other states. In regard to Dr. Boston's statement, the diagnosis in many of the cases in which the appendix has been removed is subacute or chronic appendicitis. I have learned of at least twelve cases of undulant fever in which a normal appendix has been removed.

DR. A. S. GIORDANO, South Bend, Ind.: In reply to Dr. Hardy's question the lantern slides shown to demonstrate the intradermic reaction were made from a case of undulant fever dating back seven years, and at the time of the test agglutinins for *Brucella abortus* were absent. The patient was Dr. Carpenter himself. I hope I have not left the impression that the intradermic test will replace the agglutination or any other test. If the test should prove to be specific, then we have acquired another strong link in the chain for the clinical diagnosis, which is difficult early in the disease when the blood culture and the agglutination reaction are negative. For the purpose of collecting data, I ask that the intradermic reaction be used only in proved cases until sufficient data are obtained. I disagree with Dr. Simpson about the ease with which the clinical diagnosis can be made. I think the chief reason for the uncovering of a large number of cases in and around Dayton lies in Dr. Simpson's educational efforts in his community in keeping on the lookout for such cases, and not in any lack of difficulty in establishing the clinical diagnosis without bacteriologic and serologic data, particularly early in the disease. For this reason cases that run only a short clinical course are completely overlooked because most of the literature regards undulant fever as a long drawn-out disease with the characteristic undulations and relapses. Such has not been my experience. There are many clinical entities that can be confused with *Brucella abortus* infection, and for that reason clinical differentiation is impossible without the aid of the laboratory.

THERAPEUTIC ANTIMENINGOCOCCUS SERUMS

MEASUREMENT OF THEIR NEUTRALIZING POTENCY BY MEANS OF THE PHENOMENON OF LOCAL SKIN REACTIVITY *

GREGORY SHWARTZMAN, M.D.
NEW YORK

Studies on the toxic substances derived from the meningococcus are of especial interest since progress in the treatment of cerebrospinal fever undoubtedly depends on a thorough understanding of these substances. The extensive literature on this subject is reviewed by Murray.[1] It is generally believed that these substances appear as a result of massive cell autolysis (endotoxins). Some investigators were able to obtain highly toxic substances in culture filtrates (Ohlmacher,[2] Flexner [2]). I [3] reported highly toxic culture filtrates obtained under conditions in which comparatively little cell autolysis could be expected to occur.

Animals vary considerably in their individual susceptibility to the toxic substances obtained in various ways, so that sometimes small doses kill the animals and larger doses produce no effect. It is therefore extremely difficult to make a quantitative determination of their potency by the "lethal dose" method. In addition, these substances appear to be quite unstable. The strains of meningococcus also vary in their toxigenicity.

The effect of serums on the meningococcus toxic substances was studied by Kraus and Doerr, Wassermann and Leuchs, Kraus and Baecher, Flexner, Dopter, Boehncke and Krumbein, and more recently by Gordon.[1] These studies bring out the fact that the lethal effect of these toxic substances can be neutralized by immune serums. Normal serums appear to have some neutralizing potency as well. It seems from Gordon's studies [1] that those therapeutic serums which were most effective in the treatment of military cases of meningitis were distinguished by their being able to neutralize one minimal lethal dose of meningococcus "endotoxin" prepared by his methods, whereas serums of lesser therapeutic value failed. Because of the variable factors (instability of toxic substances, varying susceptibility of animals), the quantitative measurement of the neutralizing potency of therapeutic serums based on these factors is rendered impracticable and unreliable. For this reason it is impossible to prepare consistently powerful antitoxic serums for therapeutic use.

In a series of reports [4] that I have made since April, 1928, there was described a new immunologic phenome-

* From the Laboratories of the Mount Sinai Hospital.

1. Bibliography given in Murray, E. G. D.: The Meningococcus, Medical Research Council, Special Report Series number 124, 1929.

2. Bibliography given in Kolle und Wassermann: Handbuch der pathogenen Mikroorganismen, Meningokokken Infektionen **4:** 606, 1928.

3. Shwartzman, Gregory: Preparation of Meningococcus Toxic Substances Necessary for Phenomenon of Local Skin Reactivity, J. Infect. Dis., to be published.

4. Shwartzman, Gregory: A New Phenomenon of Local Skin Reactivity to B. Typhosus Culture Filtrate, Proc. Soc. Exper. Biol. & Med. **25:** 360, 1928; Studies on B. Typhosus Toxic Substances: I. Phenomenon of Local Skin Reactivity to B. Typhosus Culture Filtrate, J. Exper. Med. **48:** 247 (Aug.) 1928; Effect of Immune Sera upon the Phenomenon of Local Skin Reactivity to B. Typhosus Culture Filtrates, Proc. Soc. Exper. Biol. & Med. **26:** 131, 1928; Studies on B. Typhosus Toxic Substances: II. The Effect of Sera upon the Factors Determining Local Skin Reactivity to Filtrates of B. Typhosus Cultures, J. Exper. Med. **49:** 593, 1929; Phenomenon of Local Skin Reactivity to Culture Filtrates of Various Micro-Organisms, Proc. Soc. Exper. Biol. & Med. **26:** 207, 1928; An Improved Method of Preparing B. Typhosus Toxic Substances Necessary for the Phenomenon of Local Skin Reactivity, ibid. **26:** 843, 1929; Preparation of Meningococcus Toxic Substances Necessary for Phenomenon of Local Skin Reactivity, J. Infect. Dis., to be published; Ammonium Sulphate Precipitation of B. Typhosus Toxic Substances Concerned in the Phenomenon of Local Skin Reactivity, ibid., to be published; Studies on B. Typhosus Toxic Substances: III. The Effect of Sera upon the Injury Producing Factors of the Phenomenon of Local Skin Reactivity, J. Exper. Med., to be published.

non elicited by means of bacterial toxic substances. It was shown that a local skin reactivity to culture filtrates of *Bacillus typhosus* and certain other micro-organisms could be obtained. The reactivity was induced by the injection of a filtrate into the skin of a rabbit. If twenty-four hours later an intravenous injection of the same filtrate was given to the rabbit, there appeared four or five hours after the intravenous injection an extremely severe hemorrhagic necrosis at the site of the previous injection. The factors determining the local skin reactivity were called "skin preparatory factors" and those responsible for the local injury following the intravenous injection were termed "reacting factors." A detailed study of the phenomenon as exemplified by *Bacillus typhosus* was made. Features characteristic of this phenomenon which distinguish it sharply from the Arthus phenomenon and phenomena of bacterial hypersusceptibility were described.

Among the various properties of the *Bacillus typhosus* skin preparatory and reacting factors thus far reported, the following may be mentioned:

1. The skin preparatory and reacting potency of the filtrates can be consistently titrated.

2. Both types of factors can be specifically neutralized by immune serums. In this manner the neutralizing potency of the antityphoid serums can be quantitatively measured.[5] These properties, in addition to others to be reviewed at a later date, point strongly to the fact that the substances concerned in the phenomenon belong to the class of true neutralizable toxins.

It has already been shown in earlier discussion that the status of preparing and titrating powerful therapeutic meningococcus antitoxic serums is extremely unsatisfactory. Encouraged by the fact that by taking advantage of the new immunologic phenomenon of local skin reactivity I was able consistently to prepare and titrate antityphoid serums of high neutralizing potency, I hoped that a direct application of this method could be made in the case of the meningococcus.

Accordingly, parallel studies on the phenomenon of local skin reactivity to culture filtrates of meningococcus were conducted. In these studies[6] it was found that meningococcus culture filtrates prepared by the methods described yielded the factors necessary for the phenomenon, that the potency of the filtrates could be easily titrated, and that the meningococcus skin preparatory factors could be neutralized by specific immune serums. The purpose of the work reported in this paper was to determine whether the antimeningococcus immune serums could neutralize the meningococcus reacting factors and, if so, whether this could be applied as a method for the titration of the neutralizing potency of these serums.

EXPERIMENTAL WORK

The Titration of Meningococcus Reacting Factors Against a Constant Amount of Skin Preparatory Factors.—Filtrates of washings of 20 to 22 hour old meningococcus (group I, strain 44D, New York Board of Health) grown on 0.7 per cent dextrose agar were employed (batch A6). The method of preparation of the filtrates has been reported in detail in a previous communication.[7]

Preliminary titrations established the fact that a dose as small as 0.25 cc. of the filtrate previously diluted 1 : 10 was capable of preparing the skin of some of the rabbits to the phenomenon, provided sufficiently large intravenous doses were subsequently employed. Because of the dilution, however, there occurred individual fluctuations.[7] In order to obtain a high degree of reactivity necessary for the work to be described, the rabbits were prepared with several multiples of the indicated minimal skin preparatory dose and the reacting factors were titrated in these rabbits as follows:

Twenty rabbits received each one intradermal injection of 0.25 cc. of the filtrate A6 previously diluted 1 : 2. Twenty-four hours later the rabbits were divided into four groups of five. Each group received a single intravenous injection of the same filtrate. The first group received 0.2 cc., the second group 0.1 cc., the third group 0.05 cc. and the fourth group 0.01 cc., respectively, per kilogram of body weight. Four and one-half hours later severe hemorrhagic reactions were observed in five rabbits of the first group, in the three surviving rabbits of the second group, in three out of four surviving rabbits of the third group and in only one out of five surviving rabbits of the fourth group.

From this titration it will be seen that 0.05 cc. of filtrate A6 per kilogram is the minimal dose of reacting factors capable of eliciting reactions in a large percentage of rabbits prepared with 0.25 cc. of the filtrate previously diluted 1 : 2.

TABLE 1.—*The Effect of Antimeningococcus Serums on Meningococcus Reacting Factors*

Mixtures Made in Vitro							
Intradermal Dose of A_6	Intravenous Dose of A_6 per Kg.	Intravenous Dose of Serum per Kg.	Total of Rabbits Tested	Number of Positive Rabbits	Number of Negative Rabbits	Number of Doubtful Rabbits	Number of Deaths
0.25 cc. of 1:2 dilution	1.5 cc. of 1:10 dilution	.....	58	32	6	5	15*
0.25 cc. of 1:2 dilution	1.5 cc. of 1:10 dilution	New York Health Serum 147/419, 1 cc. of dil. 1:10	55	10	40	3	2

* The reactions seen in the dead rabbits, even when well defined, were not included in this table.

For the neutralization experiments about to be described, several multiples of the minimal doses of reacting factors were employed in order to assure a high percentage of positive reactions in rabbits. Furthermore, as a certain proportion of rabbits were spontaneously resistant to the phenomenon, at least five rabbits were employed for each neutralization experiment.

One batch of the filtrate A6 stored in the refrigerator was employed throughout the work. The filtrate was first used for the experiments two months after its preparation and its use was continued for two months afterward. Five control titrations were made during the four months following the preparation of the filtrate. According to these titrations, the potency of the filtrate became somewhat lower four weeks after its preparation but remained the same for the remaining three months. The experiment just described represents the titer of the filtrate after it became stabilized. In addition, whenever a serum neutralization experiment was carried out, a control group of from four to six rabbits was injected with the filtrate alone. These control experiments afforded additional proof that the filtrate did not suffer any change in potency during the time in which the work was carried out.[8]

Neutralization of Meningococcus Reacting Factors by Specific Immune Serums.—The horse serums tested

5. Shwartzman (footnote 4, third, fourth and ninth references).
6. Shwartzman (footnote 4, fifth and seventh references).
7. Shwartzman (footnote 4, seventh reference).

8. Shortly after the work was completed there was observed a considerable fall in the potency of the filtrate.

were obtained from the New York Board of Health, Lederle and Mulford. Serums R 227 and R 225 were obtained from rabbits immunized by intravenous injections of unwashed heat killed vaccine of meningococcus, strain 44 D, group I. The injections were given twice a week and the doses gradually increased. Rabbits 227 and 225 were immunized for a period of three and one-half and five weeks, respectively. The first dose injected was about 1 billion and the last dose injected about 15 billion organisms. Antityphoid horse serum (H 62/4) also was employed. The serum had the filtrate alone were incubated in a water bath at 37 C. for one hour. The readings of the reactions were made four and one-half hours after the intravenous injection. A rabbit was recorded as "positive" when the prepared area of the skin showed severe hemorrhagic necrosis. "Doubtful" rabbits were those showing mild punctiform reactions of dark red appearance. In the "negative" rabbits, no reactions were seen. Some of the rabbits died in the course of the four and one-half hours following the intravenous injection. Their deaths were recorded. If the dead rabbits showed no

TABLE 2.—*Titration of Neutralizing Potency of Serums*

Intradermal Dose of A_6	Mixtures Made in Vitro: Intravenous Dose of A_6 per Kg.	Mixtures Made in Vitro: Intravenous Dose of Serum per Kg.	Number of Rabbits Tested	Number of Positive Rabbits	Number of Negative Rabbits	Number of Doubtful Rabbits	Number of Deaths	Neutralizing Titer of Serums
0.25 cc. of 1:2 dilution	1.5 cc. of 1:10 dilution	New York Board of Health* 153/50, 1 cc. 1:20 dilution	5	3	1	0	1	
0.25 cc. of 1:2 dilution	1.5 cc. of 1:10 dilution	New York Board of Health 153/50, 1 cc. 1:15 dilution	5	1	3	0	1	1:15
0.25 cc. of 1:2 dilution	1.5 cc. of 1:10 dilution	New York Board of Health 153/50, 1 cc. 1:10 dilution	10	1	7	1	1	
0.25 cc. of 1:2 dilution	1.5 cc. of 1:10 dilution	New York Board of Health 154/67, 1 cc. 1:20 dilution	5	3	1	0	1	
0.25 cc. of 1:2 dilution	1.5 cc. of 1:10 dilution	New York Board of Health 154/67, 1 cc. 1:15 dilution	5	0	4	1	0	1:15
0.25 cc. of 1:2 dilution	1.5 cc. of 1:10 dilution	New York Board of Health 154/67, 1 cc. 1:10 dilution	5	1	4	0	0	
0.25 cc. of 1:2 dilution	1.5 cc. of 1:10 dilution	New York Board of Health 154/67, 1 cc. 1:5 dilution	5	2	2	0	1	
0.25 cc. of 1:2 dilution	1.5 cc. of 1:10 dilution	New York Board of Health 978/15, 1 cc. 1:30 dilution	5	3	2	0	1*	
0.25 cc. of 1:2 dilution	1.5 cc. of 1:10 dilution	New York Board of Health 978/15, 1 cc. 1:25 dilution	5	2	3	0	0	1:25
0.25 cc. of 1:2 dilution	1.5 cc. of 1:10 dilution	New York Board of Health 978/15, 1 cc. 1:20 dilution	5	1	4	0	0	
0.25 cc. of 1:2 dilution	1.5 cc. of 1:10 dilution	New York Board of Health 978/15, 1 cc. 1:10 dilution	5	3	2	0	0	
0.25 cc. of 1:2 dilution	1.5 cc. of 1:10 dilution	New York Board of Health 148/458, 1 cc. 1:30 dilution	5	3	2	0	0	
0.25 cc. of 1:2 dilution	1.5 cc. of 1:10 dilution	New York Board of Health 148/458, 1 cc. 1:20 dilution	5	3	2	0	0	Less than 1:20; 1:15?
0.25 cc. of 1:2 dilution	1.5 cc. of 1:10 dilution	New York Board of Health 148/458, 1 cc. 1:10 dilution	5	1	4	0	0	
0.25 cc. of 1:2 dilution	1.5 cc. of 1:10 dilution	Mulford 23863-1, 1 cc. 1:30	5	3	2	0	0	
0.25 cc. of 1:2 dilution	1.5 cc. of 1:10 dilution	Mulford 23863-1, 1 cc. 1:25	5	2	3	0	0	
0.25 cc. of 1:2 dilution	1.5 cc. of 1:10 dilution	Mulford 23863-1, 1 cc. 1:20	5	2	3	0	0	1:25
0.25 cc. of 1:2 dilution	1.5 cc. of 1:10 dilution	Mulford 23863-1, 1 cc. 1:10	5	1	4	0	0	
0.25 cc. of 1:2 dilution	1.5 cc. of 1:10 dilution	New York Board of Health 147/419, 1 cc. 1:35 dilution	5	3	1	1	0	
0.25 cc. of 1:2 dilution	1.5 cc. of 1:10 dilution	New York Board of Health 147/419, 1 cc. 1:30 dilution	5	1	4	0	0	1:30
0.25 cc. of 1:2 dilution	1.5 cc. of 1:10 dilution	New York Board of Health 147/419, 1 cc. 1:20 dilution	5	1	4	0	0	
0.25 cc. of 1:2 dilution	1.5 cc. of 1:10 dilution	Lederle 56H220P, 1 cc. 1:5	5	3	2	0	0	Negative
0.25 cc. of 1:2 dilution	1.5 cc. of 1:10 dilution	Lederle 56H220P, 1 cc. 1:10	5	3	2	0	0	or doubtful
0.25 cc. of 1:2 dilution	1.5 cc. of 1:10 dilution	Lederle 56H220P, 1 cc. 1:20	5	3	1	0	1	neutralizing
0.25 cc. of 1:2 dilution	1.5 cc. of 1:10 dilution	Lederle 56H220P, 1 cc. 1:30	5	4	1	0	1*	potency
0.25 cc. of 1:2 dilution	1.5 cc. of 1:10 dilution	R 225, 1 cc. 1:30	5	3	1	1	0	1:25?
0.25 cc. of 1:2 dilution	1.5 cc. of 1:10 dilution	R 225, 1 cc. 1:20	5	0	3	1	1	Less than
0.25 cc. of 1:2 dilution	1.5 cc. of 1:10 dilution	R 225, 1 cc. 1:10	5	0	4	0	1	1:30
0.25 cc. of 1:2 dilution	1.5 cc. of 1:10 dilution	R 227, 1 cc. 1:30	5	4	1	0	0	Negative
0.25 cc. of 1:2 dilution	1.5 cc. of 1:10 dilution	R 227, 1 cc. 1:20	5	3	1	1	0	or doubtful
0.25 cc. of 1:2 dilution	1.5 cc. of 1:10 dilution	R 227, 1 cc. 1:10	5	3	1	0	1	neutralizing potency
0.25 cc. of 1:2 dilution	1.5 cc. of 1:10 dilution	Antityphoid horse serum H62/4, 1 cc. 1:10 dilution	45	23	10	2	10	Negative or
0.25 cc. of 1:2 dilution	1.5 cc. of 1:10 dilution	Antityphoid horse serum H62/4, 1 cc. 1:5 dilution	5	3	1	0	1	doubtful neutralizing
0.25 cc. of 1:2 dilution	1.5 cc. of 1:10 dilution	Antityphoid horse serum H62/4, 1 cc. 1:20 dilution	5	4	1	0	0	potency

* The reading of a well defined reaction of the dead rabbit is included.

a high titer of neutralizing antibodies for *Bacillus typhosus* reacting factors.[9]

The experiments were conducted in a manner similar to that described in previous papers. One area of the skin of the abdominal wall of a rabbit was injected with 0.25 cc. of the filtrate A6 previously diluted 1 : 2. From twenty-two to twenty-four hours later a single intravenous injection of the filtrate or of a mixture of the filtrate with a given serum was made. The mixtures prepared on the morning of the experiment as well as reactions or a diffuse discoloration of the skin, no readings were recorded. When, however, there was observed a well defined reaction, the result was often noted.

Table 1 represents a summary of the results obtained. As may be seen from this table, the skin and intravenous doses employed elicited reactions in 74.4 per cent of the surviving rabbits. When a mixture of the filtrate with a therapeutic antimeningococcus serum was injected intravenously, reactions were obtained in only about 19 per cent of the surviving rabbits. This experi-

9. Shwartzman (footnote 4, ninth reference).

ment establishes the fact that the meningococcus reacting factors can be neutralized by the immune serum. However, the neutralization of the reacting factors has to be considered "irregular" since some of the rabbits show reactions. The irregularity of neutralization may be explained by assuming either that the mixture contained a small amount of free reacting factors or that there was only partial neutralization of these factors. In either case, only those rabbits possessing a high degree of reactivity were able to respond with reactions. The spontaneous variations in the degree of reactivity of rabbits have already been discussed.[10]

Neutralization experiments with the *Bacillus typhosus* reacting factors demonstrated the fact that certain immune serums could be obtained which give "consistent" neutralization; i. e., complete inhibition of reactions in a large number of rabbits tested.[1] Only if the serum is diluted or if the amount of the reacting factors is too large is "irregular" neutralization obtained; i. e., inhibition of reactions in only a certain percentage of rabbits tested. The maximum amount of the reacting factors "consistently" neutralized by 0.25 cc. of a given batches of serum. From this table it becomes evident that no serums were found that were capable of "consistent" neutralization of the meningococcus reacting factors. A number of serums were, however, found which in certain dilutions were capable of inhibiting reactions in at least three out of five rabbits tested. As the dilution of the serum increased, the reactions appeared in a larger percentage of rabbits. As previously agreed, the highest dilution of serum capable of inhibiting reactions in at least three out of five rabbits injected with the indicated doses of A6 was taken as the neutralizing titer of the serum (serums New York Board of Health 153/59; 154/67; 978/15; 148/438; 147/419; Lederle 23863 and R 225).

With some of the serums in certain dilutions there were obtained reactions in three out of five rabbits tested and in higher dilutions in four out of five tested (Lederle 56 H220P, R 227 and antityphoid horse 62/4 serum). Since the control groups of rabbits injected with the filtrate alone rarely showed reactions in less than four out of five rabbits tested,[11] it was not considered safe to regard these serums as totally lacking

TABLE 3.—*Agglutination of 44D, Group I Meningococcus by Various Serums*

Serums Tested *	Degree of Agglutination with Various Dilutions of Serums and a Constant Amount of Meningococcus Suspension †								Expiration Date of Serums	Neutralizing Titer of Serums
	1:40	1:80	1:160	1:320	1:640	1:1,280	1:2,560	1:5,120		
New York Board of Health 153/59	1+	2+	3+	3+	2+	—	—	—	July 14, 1929	1:15
New York Board of Health 154/67	1+	3+	3+	2+	2+	—	—	—	Aug. 19, 1929	1:15
New York Board of Health 978/15	1+	2+	2+	3+	4+	4+	3+	1+	None	1:25
New York Board of Health 148/438	2+	2+	2+	3+	3+	1+	—	—	July 14, 1929	1:15
Mulford 23863-1	—	1+	1+	1+	1+	1+	—	—	Feb. 6, 1929	1:25
Lederle 56H220P	1+	2+	2+	1+	1+	—	—	—	June, 1929	±
R 225	1+	2+	3+	4+	4+	4+	3+	1+	—	1:25?
R 227	4+	4+	4+	4+	4+	3+	2+	—	—	±
New York Board of Health 147/419	2+	2+	3+	1+	—	—	—	—	July 8, 1929	1:30
Antityphoid serum H 62/4	2+	2+	±	—	—	—	—	—	—	±

* Serums were tested on July 23, 1929. Then neutralization tests recorded in the tables were done during the month of July, 1929.
† A stable antigen about one month old was used. The tubes were kept at 56 C. for twenty-two hours. A negative result is indicated by the minus sign.

serum in five rabbits tested was tentatively used to compute the neutralizing potency of the serum.

It became evident, however, from preliminary experiments with meningococcus filtrates that sufficiently powerful serums could not be found among the various batches of therapeutic antimeningococcus horse serums obtained which are capable of "consistent" neutralization similar to that obtained in the work on *Bacillus typhosus*. Moreover, since it was highly desirable to compare the potency of these various serums, it was decided to compute their potency for these purposes by accepting a weaker standard as basis. Thus instead of requiring that complete neutralization be obtained in five rabbits out of five (as in typhoid), the highest dilution of the serum capable of inhibiting reactions in at least three out of five rabbits injected with the doses indicated of A6 (table 1) was *tentatively* considered as the neutralizing titer of the serum.

TITRATION OF HETEROLOGOUS AND HOMOLOGOUS SERUMS

The second part of this paper deals with the work on the titration of the neutralizing potency of heterologous and homologous serums based on this standard. A comparison is also made between the agglutinating and neutralizing titers of these serums.

Titration of the Neutralizing Potency of Antimeningococcus and Heterologous Serums.—Table 2 represents the results obtained in the titration of ten different in neutralizing antibodies. These serums were therefore recorded as of "negative or doubtful neutralizing potency."

The effect of the heterologous serum (antityphoid horse serum H 62/4) is of especial interest. As mentioned before, the serum possessed a remarkably high neutralizing potency for *Bacillus typhosus* reacting factors.[9] In testing the effect of this serum on the meningococcus reacting factors, various dilutions were employed and tried in fifty-five rabbits. The result was "negative or doubtful neutralizing potency." This experiment demonstrates clearly the specificity of the meningococcus reacting factors.

In addition, the occurrence of the prozone phenomenon should be noted. In some instances (978/15 and 154/67) low dilutions of serums failed to neutralize the factors, whereas the higher dilutions were able to do so.

One of the serums tested (978/15 N. Y. B. H.) was a concentrated and purified "antibody solution" prepared by Banzhaf.[12] The product was of considerable neutralizing potency, which, however, did not exceed the potency of certain other crude serums tested. It remains unknown whether the methods employed by him brought about concentration of the neutralizing antibodies, since the potency of the crude serum from which it was derived was not tested.

10. Shwartzman (footnote 4, second and seventh references).

11. The readings of well defined reactions in dead rabbits are included.

12. Neal, Josephine B.; Jackson, H. W.; Appelbaum, Emanuel; and Banzhaf, E. J.: Possibility of Use of Antibody Preparations in Treatment of Epidemic Meningitis, J. A. M. A. **91**:1427 (Nov. 10) 1928.

Comparison Between the Neutralizing and Agglutinating Titers of Serums.—The following becomes evident from a comparative study of the agglutinating and neutralizing titers of various serums, as presented in table 3:

In some instances serums of the same agglutinating titer were of equal neutralizing potency (153/59, 154/67, 148/438); some serums of high neutralizing potency (1:25 or 1:30) were also of high agglutination titer (978/15 and R 225). On the other hand, a serum poor in agglutinins which had expired some months before was of a high neutralizing potency (Mulford 23863-1), and a rabbit serum of high agglutinating titer was of a "negative or doubtful neutralizing potency" (R 227). Therefore it becomes evident that the agglutination titer of antimeningococcus serums does not necessarily bear a relationship to their neutralizing potency.

It is also important to point out that numerous investigators have recognized the discrepancy between the agglutinating potency of therapeutic serums and their clinical value (Wadsworth and others [13]). In a recent publication Neal, Jackson, Appelbaum and Banzhaf [12] again draw attention to this fact. Incidentally, they also cite an instance in which an old preparation of serum very poor in agglutinins gave excellent clinical results.

Finally, it must be pointed out that the titrations recorded here refer only to type I meningococcus in spite of the fact that some of the serums were polyvalent. The results recorded in this paper are intended merely to indicate this method. Obviously, titrations should be done against toxic substances derived from other serologic types.

SUMMARY AND CONCLUSIONS

As shown in this paper, the neutralizing potency of antimeningococcus serums can be demonstrated and quantitatively measured by means of the phenomenon of local skin reactivity.

The titer of neutralizing antibodies of serums determined by this method bears no apparent relationship to the titer of agglutinins.

It is intended to standardize further the method described and to use it for the development of therapeutic serums highly potent in neutralizing antibodies.

Fifth Avenue and One Hundredth Street.

13. Bibliography given by Hetsch, O. R.: Die Werthemessung der Schutz und Heilseren, in Kolle and Wassermann: Handbuch der Pathogenen Mikroorganismen **2**: 286-300, 1927.

The Census and Blindness.—Statistics of causes of blindness are lacking in many things that would add to their value. Those gathered in an earlier period do not apply for the present development of medicine. Those gathered in one part of the world would be misleading in another part. In different sections of this country the relative frequency of certain causes differs greatly. Different races, social conditions, occupations and prevalent diseases present different causes of blindness. The general census, which accumulates so much information on a wide range of subjects, including many for which specially qualified examiners are provided, leaves the matter of blindness to census takers, who get their information from people without any knowledge of the causes of blindness, and who may be interested in concealing the main facts. The census is notoriously inaccurate and incomplete, in its conclusions as to blindness.—Jackson, Edward: Causes and Prevention of Blindness in Colorado, *Colorado Med.*, December, 1929.

Clinical Notes, Suggestions and New Instruments

CEREBROSPINAL RHINORRHEA FOLLOWING INTRANASAL SURGERY

ALBERT E. BULSON, M.D., AND EUGENE L. BULSON, M.D.,
FORT WAYNE, IND.

Cerebrospinal rhinorrhea is a discharge of cerebrospinal fluid through the nose. The condition was recognized and described by Thomas Willis in 1676; Morgagni described a case in 1762, and Charles Miller in 1826. Many cases have been regarded as nasal hydrorrhea, which is simply a discharge from the nasal mucous membrane and from which cerebrospinal rhinorrhea should be differentiated. Not a large number of cases have been reported either in this country or abroad, but the condition has assumed a definite entity, even though rare in its occurrence. The fluid which escapes into the nose is clear and watery, in contrast to the slightly opalescent and more viscid fluid of nasal hydrorrhea. The dripping is constant and is free from taste, sediment, odor, albumin and mucus. It usually drips from one side of the nose only, whereas with nasal hydrorrhea the dripping is from both sides. The amount of cerebrospinal fluid discharged in twenty-four hours may reach from 12 to 16 ounces, and in one instance is reported to have reached 32 ounces.

The diagnosis in such cases rests on an analysis of the fluid, and Thompson and others have given a table showing the essential tests for cerebrospinal fluid which need not be repeated here. In analyzing the reported cases it appears that cerebrospinal rhinorrhea may occur spontaneously by leakage through the cribriform plate of the ethmoid bone into one nasal chamber, from which it is discharged in drops, or it may be caused by trauma, including intranasal surgery. It is a case of the latter type which has come to our attention and brings forth this report.

REPORT OF CASE

A married woman, aged 40, residing in a distant small city, was seen first in February, 1921, when refraction was done. At that time the routine examination of the nose showed a slight irregularity of the septum; the turbinates were fairly normal, and the tonsils were submerged. No history of any catarrhal trouble of the nose or of obstructed breathing was obtained. She was seen again about a year later when the reading lenses were changed.

Sept. 12, 1922, the patient returned and reported that two months previously a physician had operated on her nose, removing the turbinates from both sides, since which time she had been in bed most of the time suffering from severe headaches, general weakness, and a constant flow of clear watery fluid from the right side of the nose. The discharge of fluid was sufficient to annoy her both night and day, and seemed to be fairly continuous.

An examination of the nose disclosed that the left inferior turbinate had been removed completely, and there were extensive adhesions between the septum and the lateral wall on that side. The only opening to the postnasal space was a very small one along the floor of the nose. On the right side the inferior turbinate had been removed completely, except a small tag posteriorly. The middle turbinate also had been removed and in the region of the posterior ethmoid cells there was a mass of polypoid and granulation tissue which distinctly showed pulsation. The patient was wiping her nose almost constantly, and if she stooped forward a clear, watery fluid dripped from the right nostril. About a drachm of this fluid was collected and sent to a competent pathologist, who reported that the specimen was cerebrospinal fluid. The polypoid material in the region of the anterior ethmoidal cells was removed carefully and the entire upper naris was swabbed gently with a 5 per cent alcoholic mercurochrome solution. She was given a 25 per cent solution of mild silver protein to use in the nose with a medicine dropper while the head was tipped back, and advised not to use a douche or atomizer, and not to blow the nose violently.

The patient refused to enter a hospital, and returned to her home and to her bed, to which she had been confined almost continuously following the nasal operation. She again remained in bed almost continuously for a period of three months, during which time she was physically unable to be up and around, and throughout the entire time suffered from headaches, varying in severity, and from a continuous dripping of the cerebrospinal fluid. The patient was not seen again until two years later, though during that period several specimens of the fluid dripping from the nose were collected and sent to us for examination, the report from the laboratory each time being that the specimen submitted was cerebrospinal fluid.

Late in 1924 the patient was seen again, and at that time she reported that the dripping from the nose continued but was less profuse. There also was less headache and she had gained in strength and weight. She had not received treatment of any kind. An examination of the right side of the nose showed that there was considerable granulation tissue in the region of the posterior ethmoid, and no discoverable pulsation. As late as June 25, 1928, practically six years after the nasal operation, a specimen of fluid from the nose was submitted and the laboratory reported it as being cerebrospinal fluid, though at that time the husband of the patient reported that the fluid appeared periodically and that sometimes for weeks there would be little if any dripping from the nostril.

COMMENT

The interesting feature of this case is the length of time during which cerebrospinal fluid has discharged from the nose, and the fact that meningitis has not occurred as the result of infection. So far as we can learn, no similar case has been reported in the literature. Campbell[1] says that eight cases are reported in the literature, in three of which death took place from meningitis; in five there was recovery. In all the patients who lived, the flow of cerebrospinal fluid ceased within a few days, or a few weeks at most. In all the cases the opening was small, whereas in our case the opening was large and that probably accounts for the increased time required for closure by granulation. Conservative treatment is indicated, with strict avoidance of intranasal manipulation.

406 West Berry Street.

CHRONIC BENZENE POISONING IMPROVED BY LIVER

ADELAIDE ROSS SMITH, M.D., NEW YORK

In cases of severe chronic poisoning by benzene fumes, transfusion has been the treatment of choice. This case is reported because it illustrates recovery after the institution of a liver diet when three transfusions had been ineffective, and it suggests therefore that liver therapy may prove of considerable value in combating this important industrial intoxication.

REPORT OF CASE

A man, aged 38, a Greek-American laborer, was admitted to the hospital, Nov. 16, 1928, because of severe bleeding from the gums of three weeks' duration with frequent epistaxis and spontaneously appearing black and blue spots on the skin during the two weeks previous to admission. The family history and past history were essentially negative.

He had been an iron worker until August, 1928, when he entered an artificial leather shop. Here he worked in the coating room applying a benzene-rubber compound, which he scooped out of a barrel, to the material to be coated. Shortly after beginning this work he lost his appetite and felt nauseated at times while in the shop, vomiting about once a week. After working approximately three months, he noticed itching of the skin of the extremities and at the same time he began to bleed rather freely from the gums.

A tooth was extracted, but bleeding from the socket persisted. Two weeks before admission he began to suffer from epistaxis, which occurred three or four times, and during the same period he noted the sudden appearance of many purplish spots all over his body without any preceding trauma. Four days before admission he consulted a physician and another dentist, who extracted two more teeth. Bleeding from these sockets was profuse. This physician administered calcium by mouth and 40 cc. of a thromboplastic substance hypodermically and packed the sockets for the relief of bleeding but to no avail. The patient was then sent to the hospital with a diagnosis of purpura hemorrhagica.

On admission the temperature was 101.2 F.; the pulse rate, 96, and respiration 24. The blood pressure was 125 systolic and 80 diastolic. The patient was well developed and well nourished and had many purpuric spots on the legs, thighs, buttocks, abdomen and right forearm. There were many petechiae of varying size on the inner aspect of both arms. There was a vile odor from the mouth; the teeth were in poor condition and there were many bleeding points in the gums. Two recent extraction wounds were packed with blood-soaked dressings. The heart, lungs and abdomen were normal. The blood count was as follows: hemoglobin, 62 per cent; red blood cells, 3,300,000; white blood cells, 1,350; polymorphonuclears, 25 per cent; lymphocytes, 75 per cent, and platelets, 25,000. The bleeding time was thirty-three minutes.

On the basis of the history of exposure to benzene, which was verified, and the marked leukopenia, a diagnosis of chronic benzene poisoning was made. A direct transfusion of 500 cc. was given the day after admission. Following this, oozing from the gums ceased temporarily but recommenced four days later and a blood count made three days after the transfusion showed a decline over the previous one. At this time the hemoglobin was 56 per cent; red blood cells, 2,820,000; white blood cells, 1,300; polymorphonuclears, 36 per cent; lymphocytes, 52 per cent, and mononuclears, 12 per cent.

A second blood transfusion of 200 cc. was given by the indirect method six days after the first and a third of 500 cc. by the same method three days later. In spite of these transfusions, oozing from the gums continued and a blood count made the day after the third transfusion did not show any improvement: The red blood cells numbered 2,830,000; white blood cells, 1,240; polymorphonuclears, 34 per cent; lymphocytes, 58 per cent, and mononuclears, 6 per cent.

November 30, three days after the third transfusion, it was decided to try the effect of liver, and half a pound daily was included in the diet. The white cell count was 1,480 three days later, showing a slight increase. It was then, for the first time, greater than it had been on admission. This progressive increase in the leukocytes continued more or less steadily from that time on. Eight days later, December 11, the white cell count was 3,900, though the hemoglobin remained low, 39 per cent, and the erythrocytes did not show any increase. Coincidentally with improvement in the leukocyte count, bleeding from the gums diminished and was practically absent after December 9. After a month of liver diet the reticulocytes reached 8.6 per cent, their highest point, whence they gradually diminished again to 3.1 on discharge. Improvement in hemoglobin and red cells lagged noticeably behind that in the leukocytes, a characteristic sequence in recovery from poisoning of this type.

Liver therapy was continued for seven weeks and the patient kept under observation for three weeks longer. Cessation of the liver diet did not bring about a fall in the blood count, the recuperative processes having by that time, apparently, been well established.

At discharge, February 13, the hemoglobin was 59 per cent; the red blood cells numbered 3,780,000; white blood cells, 5,800; polymorphonuclears, 60 per cent; lymphocytes, 32 per cent; mononuclears, 6 per cent; eosinophils, 2 per cent, platelets 195,000 and bleeding time eight and a half minutes. The patient was entirely free from complaints and had an excellent appetite. He has been kept under observation to date (July, 1929) and has at the present time a normal blood picture with the exception of a slight leukopenia of 4,700. He did not resume the liver diet.

COMMENT

In a case of chronic benzene poisoning in which three transfusions had not brought about any improvement in the blood picture, definite improvement following the ingestion of whole liver does not appear coincidental. The chief effect of the liver

1. Campbell, E. H.: Cerebrospinal Rhinorrhea Following Intranasal Surgery, Ann. Otol. Rhin. & Laryng. **37**: 865 (Sept.) 1928.

diet in this case, however, was apparently on white rather than red cell production. The reticulocyte response, though present to a slight degree, was not similar to that found in pernicious anemia.

632 West One Hundred and Sixty-Eighth Street.

The Chemical Laboratory

THE FOLLOWING IS A REPORT OF THE CHEMICAL LABORATORY OF THE AMERICAN MEDICAL ASSOCIATION. P. N. LEECH, Director.

BICHLORIDOL

Bichloridol is a proprietary preparation of corrosive mercuric chloride suspended in a "palmitin"[1] base, intended for intramuscular administration; it is sold in compressible ampules called collapsules. This preparation was formerly marketed by the H. A. Metz Laboratories, Inc., New York, but is now marketed by the Duke Laboratories, Inc., New York.

In 1925 the Council on Pharmacy and Chemistry of the A. M. A. considered Bichloridol and declared it not acceptable for N. N. R., because it was marketed with indefinite statements of composition and under a nondescriptive proprietary name. At the time of this consideration, analyses were not made. Two letters have been received recently concerning this preparation. One writer stated, "One half to one grain a week gives practically no reaction and likewise mighty little therapeutic effect." In view of this, an investigation was made by the A. M. A. Chemical Laboratory.

On the open market an original package containing 100 collapsules was purchased. According to the label, each collapsule was presumed to contain 2 grains (0.12 Gm.) of corrosive mercuric chloride.

A large number of quantitative determinations were made. At first the results were so low that the laboratory considered that on long contact mercurated organic compounds had been formed and had escaped detection. To correct this, other methods of analysis were used. In all, three methods were employed, including the well known Carius method for destroying organic compounds without losing volatile constituents, followed by electrolysis of the mercury-containing solution. Essentially the same results were obtained by all three methods. The quantitative determinations indicated the following:

Method	Mercuric Chloride in One Dose: Found	Claimed
Extraction of fat with CCl_4, leaving residue of mercuric chloride which was weighed and corrected for the mercuric chloride dissolved in the CCl_4	0.0134 0.0145 0.0153 0.0139	0.12 Gm.
Extraction of $HgCl_2$ by shaking out CCl_4 solution with five portions of water followed by electrolysis of water solution	0.0137 0.0125	
Fat destroyed by Carius method and resulting solution electrolyzed	0.0138 0.0147 0.026 0.0081 0.0091	

The foregoing analysis indicates that the preparation contains only from one fifth to one tenth of the mercuric chloride claimed. A discrepancy of this magnitude is inexcusable for a product of such character. It may explain nicely why the product gave ". . . practically no reaction and . . . mighty little therapeutic effect." It also illustrates anew that physicians would do well to confine their prescribing to products accepted for New and Nonofficial Remedies.

1. As far as our records show, neither the H. A. Metz Laboratories, the original exploiter, nor the Duke Laboratories, the present exploiter of Collapsule Bichloridol, has given a statement of what is meant by the term "palmitin." The nearest approach to a statement of composition of the fat was contained in a letter from the H. A. Metz Laboratories, Inc., addressed to the Council on Pharmacy and Chemistry several years ago: "The palmitin used as a vehicle for the mercury bichloride . . . is a mixture of glycerides of fatty acids, purified by mechanical means and with a consistency adjusted to approach the various requirements conditioned upon the varying climatic changes in the entire country." (Repts. Coun. Pharm. Chem., 1923, p. 10.)

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

W. A. PUCKNER, Secretary.

ANAEROBIC ANTITOXIN (See New and Nonofficial Remedies, 1929, p. 346).

The Cutter Laboratory, Berkeley, Calif.

Polyanaerobic Antitoxin.—An antitoxic serum prepared by immunizing horses with the toxins of *B. tetani, B. welchii, Vibrion septique* and *B. oedematiens.* When a sufficiently potent antitoxic serum is obtained, the horses are bled and the serum is separated and filtered. The unitage of the tetanus antitoxin and of the Welch bacillus antitoxin is determined according to the method prescribed by the U. S. Public Health Service. The antitoxic potency against *Vibrion septique* and *B. oedematiens* toxins is determined by estimation of the number of lethal doses (for the rabbit) which the serum will neutralize. The product is marketed in bottles containing 100 cc. of the serum, each 100 cc. containing at least 5,000 units of tetanus antitoxin, 75 units of Welch bacillus antitoxin, and sufficient antitoxin to neutralize 50,000 minimum lethal doses of *Vibrion septique* toxin and 100,000 minimum lethal doses of *B. oedematiens* toxin.

Dosage.—Initial therapeutic, 100 cc. or more, repeated every eight to twelve hours as required; prophylactic, usually 50 cc.

NORMAL HORSE SERUM (See New and Nonofficial Remedies, 1929, p. 344).

H. K. Mulford Co., Philadelphia.

Normal Horse Serum Without Preservative.—Marketed in packages of one vial containing 100 cc.

POLLEN EXTRACTS-MULFORD (See New and Nonofficial Remedies, 1929, p. 33).

The following products have been accepted:

Alder Pollen Extract-Mulford; Alfalfa Pollen Extract-Mulford; Annual Sage Pollen Extract-Mulford; Apple Pollen Extract-Mulford; Aster Pollen Extract-Mulford; Blue Beech Pollen Extract-Mulford; Boneset Pollen Extract-Mulford; Brown Grass Pollen Extract-Mulford; Burning Bush Pollen Extract-Mulford; Burweed Marsh Elder Pollen Extract-Mulford; Buttercup Pollen Extract-Mulford; California Mugwort Pollen Extract-Mulford; Careless Weed Pollen Extract-Mulford; Cedar Tree Pollen Extract-Mulford; Cocklebur Pollen Extract-Mulford; Crab Grass Pollen Extract-Mulford; Dahlia Pollen Extract-Mulford; Dragon Sage Pollen Extract-Mulford; Elm Tree Pollen Extract-Mulford; English Plantain Pollen Extract-Mulford; Fescue Pollen Extract-Mulford; Golden Glow Pollen Extract-Mulford; Hickory Tree Pollen Extract-Mulford; Milo Maize Pollen Extract-Mulford; Mock Orange Pollen Extract-Mulford; Oat Pollen Extract-Mulford; Olive Pollen Extract-Mulford; Pecan Tree Pollen Extract-Mulford; Pine Tree Pollen Extract-Mulford; Poverty Weed Pollen Extract-Mulford; Prairie Grass Pollen Extract-Mulford; Privet Pollen Extract-Mulford; Quack Grass Pollen Extract-Mulford; Rabbit Brush Pollen Extract-Mulford; Rose Pollen Extract-Mulford; Salt Bush Pollen Extract-Mulford; Shad Scale Pollen Extract-Mulford; Sheep Sorrel Pollen Extract-Mulford; Slender Ragweed Pollen Extract-Mulford; Spring Amaranth Pollen Extract-Mulford; Sudan Grass Pollen Extract-Mulford; Velvet Grass Pollen Extract-Mulford; Western Giant Ragweed Pollen Extract-Mulford; Wheat Pollen Extract-Mulford; Wild Oats Pollen Extract-Mulford; Willow Tree Pollen Extract-Mulford; Winter Grass Pollen Extract-Mulford; Yellow Foxtail Grass Pollen Extract-Mulford.

These pollen extracts are marketed in 5 cc. vials containing 500 units per cubic centimeter.

They are prepared by the method given for pollen extracts-Mulford (New and Nonofficial Remedies, 1929, p. 34).

THOMPSON'S MALTOSE AND DEXTRIN.—Thompson's Maltose and Dextrin (with 2 per cent added sodium chloride).—A mixture containing maltose, 51 per cent; dextrins, 45 per cent; sodium chloride, 2 per cent; and moisture, 2 per cent.

Actions and Uses.—On the claim that maltose is more readily assimilated than other forms of sugar, Thompson's maltose and dextrin is proposed to supplement the carbohydrate of cow's milk or of water modifications of cow's milk. The nutritive value of 500 Gm. corresponds approximately to 1,933 calories.

Dosage.—Thompson's maltose and dextrin may be used in amounts sufficient to meet the requirements of a desired feeding schedule.

Manufactured by Thompson's Malted Milk Co., Inc., Waukesha, Wis. No U. S. patent or trademark.

Thompson's maltose and dextrin is prepared by utilizing the diastatic action of barley malt on cereal starches. Two per cent of sodium chloride is added in the manufacture of the product. The maltose is determined by the Munson-Walker general method (Official and Tentative Methods of Analysis of the A. O. A. C., ed. 2, p. 190; dextrin is determined by the method given in Leach: Food Inspection and Analysis, ed. 4, p. 654; moisture is determined by the method given in Official and Tentative Methods of Analysis, A. O. A. C., ed. 2, p. 177, par. 2.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, DECEMBER 21, 1929

CONSTITUTIONAL VARIATION

In considerations of the relation of man to disease, the question of the "constitution" of the individual concerned has long been one of the factors under discussion. Constitution as applied to persons has, however, always been a decidedly vague conception involving the effect of the environment on man. Heredity has been assumed to play an important part in determining constitutional types, their reaction to disease or their susceptibility to its attacks. All of this still is somewhat indefinite and seemingly difficult to interpret or approach by the current methods of investigation. As a recent writer [1] has remarked, it is extremely difficult to define the constitutional factor in language which conveys a definite meaning or to say how or why one person differs from another, with respect to the general property of susceptibility to disease, or why this property should appear to vary from time to time in a given individual or in a population as a whole. Simple observation and experience tell one that these things are true. No medical tradition is more firmly rooted in the minds of all peoples than this.

In a lecture before the Harvey Society in New York, Brown [1] has pointed out that modern bacteriology, with its more direct scientific evidences of the causative agents of many diseases, has tended to direct attention away from the individual and his constitution and to center attention on the pathogenic micro-organism rather than its host. After centuries of abstract speculation concerning the cause of disease, Brown remarked, bacteriology came like a beam of light into the darkness; micro-organisms were realities and offered the first hope of the solution of the problems of disease by the use of scientific methods. Bacteriology and immunology were like new toys. For the time being, man and his environment were cast aside and attention was focused on the so-called causative agents of disease and on the reactions produced by them when introduced into the body. New conceptions of disease were evolved with man and the micro-organism as the central figures. Subconsciously, he adds, the old idea of disease as a product of the interaction between man and his environment was first supplanted by the idea of an interaction between man and an infecting organism.

A return to the study of constitution as one of the variables in the complex problems of immunity and disease has begun to manifest itself. It no longer suffices to draw distinctions merely between normal and abnormal states. The so-called normal or healthy state embodies considerable variations in respect to susceptibility; and these are by no means impossible of analysis. A striking illustration of this thesis has already been afforded by observations [1] made in recent years at the Rockefeller Institute of Medical Research in New York. They show that "organ systems" in health do not all parallel the sizes of the widely varying individuals measured. If, as has been assumed, the relation of organ mass to body weight, individually and collectively, is one of the basic principles of organic constitution, the latter varies in some significant ways. According to the measurements of Brown and his co-workers, within certain limits the actual weight of most organs and, therefore, the combined mass of all organs varies directly with the weight of the body, but the exact relations are such as to produce a decided difference in the constitution of large and of small animals. There is a tradition, according to Brown, that, in general, large robust persons are frequently more susceptible to disease than those of the small, wiry type, and that in illness the prognosis is less favorable. This may or may not be true; but there is a constitutional parallel which might warrant such an expectation. The fact is that the mass of organs in proportion to the weight of the body served is distinctly greater for small than for large persons. Hence the normal load carried by the organs of small persons may be less and the reserve greater.

These studies are believed to show statistically that variations in the mass and mass relations of organs are constantly occurring in response to demands made by changing conditions of life and that these variations in organic constitution are accompanied by variations in chemical constitution, all of which may well be confined within the usual limits of normal, for they are normal. It can also be shown that these differences and variations in physical and chemical constitution are associated with differences and variations in functional activity and susceptibility to disease or in the degree of natural immunity. Even now, Brown concludes, there is some understanding of how and why one person differs from another in respect of the general property of susceptibility to disease and why it is that the susceptibility of persons and of populations is not fixed but varies from time to time, independent of any immunity that may be acquired through previous exposure to a given disease.

1. Brown, W. H.: Constitutional Variation and Susceptibility to Disease, Arch. Int. Med. **44**: 625 (Nov.) 1929.

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EXPERIMENTAL STUDIES OF THE COMMON COLD

The "common cold" has several characteristics that lead to its classification as an acute infection of the upper respiratory tract. Consequently, many efforts have been made to isolate and identify the etiologic agent—obviously desirable steps in the attempts to master an unquestionably disastrous human malady. The study of the flora of the upper respiratory tract in conventional ways during health and disease has led to the isolation of a considerable number of familiar bacteria, but on the whole the results have not been sufficiently specific to permit the bringing of a charge of special responsibility against any of the identified microbial species. Investigations of this character are usually greatly facilitated by the discovery of an experimental animal in which the characteristic disease manifestations either occur naturally at times or can be produced at will in the laboratory. This is well illustrated in the history of the investigations of tuberculosis and anthrax, for example.

In the case of the common cold there are somewhat analogous disorders widely recognized among the domestic animals. However, such animal diseases as distemper in dogs and snuffles in rabbits, though having a certain resemblance to the human disease, have seemed in all probability to be too dissimilar from an etiologic point of view to be of immediate value. In a search for a type showing closer resemblance to the human disease, Dochez [1] and his associates at the College of Physicians and Surgeons, New York, recently discovered that the "common cold" of man or something closely resembling it from a clinical standpoint apparently occurs among the anthropoid apes. There were indications, too, that such animals, while not under quarantine, have contracted upper respiratory infections presumably from chance human contacts. The symptoms usually began with a discharge of mucus from both nostrils, accompanied by occasional attacks of sneezing. During the act of sneezing, considerable amounts of mucus were blown from the nostrils. Somewhat later the nares became obstructed and the breathing audible. In from three to five days a cough frequently developed, lasting sometimes as long as two weeks. In some instances the discharge of mucus became purulent and continued from one or the other nostril for as long as three weeks. There was some lassitude and loss of appetite and occasionally diarrhea. The temperature was seldom elevated and then only to an insignificant degree.

Thus given an experimental laboratory species susceptible to human "colds," the New York investigators [2] have now demonstrated that filtered nasal washings obtained from human beings suffering with typical colds when injected intranasally into apes produced typical colds in about half of the instances attempted. In all positive experiments, gram-negative anaerobes of the type described by Olitsky and Gates were cultivated. However, etiologic significance was not assigned to these organisms. Control tests with washings of healthy persons were uniformly negative. In contrast with the changes noted in the positive transmission experiments there were no changes noted from the characteristic normal flora of their noses and throats. There was an entire absence of even small amounts of nasal mucous discharge following inoculation. The various observations thus collected seem, in the words of these most recent investigators of an admittedly difficult problem, to lead rather strongly to the assumption that the type of upper respiratory tract infection under consideration is caused by a filtrable virus.

1. Dochez, A. R.; Shibley, G. S., and Mills, Katherine, C.: A Study of Acute Infection of the Respiratory Tract in the Ape, Proc. Soc. Exper. Biol. & Med. **26**: 562 (April) 1929.

2. Shibley, G. S.; Mills, Katherine C., and Dochez, A. R.: Further Consideration of Transmissibility of Human Upper Respiratory Infections (Common Cold) to the Ape, Proc. Soc. Exper. Biol. & Med. **27**: 59 (Oct.) 1929.

EPITHELIAL HEALING IN SURGICAL WOUNDS

A recent writer has pointed out that the term "growth" as applied to tissue is too loose a word to use with accuracy. It indicates only increase or enlargement without expressing the means of increase or enlargement. Thus, fibrous healing in wounds takes place by the rapid production of a "fill" of new fibrous tissue between the severed portions of the preexisting fibrous structures, producing union of tissue without true growth of new tissue from old tissue. In the case of wounds of typical epithelial structures, on the other hand, the process of restitution is characterized by a true outgrowth of new tissue from preexistent, functioning tissue of like kind. Most students probably think of such a change as being brought about by mitotic division of cells resulting in a large increase of the latter about the margin of a wound.

According to the studies of Hartwell,[1] however, a somewhat different process characterizes the changes within damaged protective epithelium. He points out that the living cells of normal human epithelium are potentially ameboid cells. In the healing of wounds, covering with epithelium takes place through the ameboid movement into the wound of cells from the surrounding epithelium. Such moving cells form an "extension membrane." The process of covering with epithelium is completed by the union of two such membranes from opposite sides of the wound, followed by the rearrangement and multiplication of the cells of the membrane. Mitosis occurs secondarily to cellular movement and late in the process of healing.

From this point of view it is important that there be a suitable base for the support and advance of the

1. Hartwell, S. W.: Surgical Wounds in Human Beings — A Histologic Study of Healing with Practical Applications: I. Epithelial Healing, Arch. Surg. **19**: 835 (Nov.) 1929.

"wandering" epithelial membrane. Furthermore, anything that tends to promote the cornification of the outer layers of the new epithelium as is continually happening in the skin has a retarding influence. Accordingly, Hartwell has pointed out that from a practical standpoint the chief causes of delayed epithelial healing are the existence of a supporting wound surface unsuitable for progression of epithelial cells, and rapid cornification of the cells of the membrane due to inimical chemical or physical environment. The conditions just named, he adds, are accentuated in infected wounds. Expressed somewhat differently, it may be assumed that the best way to hasten the process of covering with epithelium is to secure in a wound such conditions as will provide the least amount of exposure inimical to the continued life of the advancing cells of the membrane, reducing the rate of cornification in the membrane and providing a suitable base for the epithelium to adhere to and to move on. It is probable, according to Hartwell, that all wound dressings have their good or ill effect according as they fulfil such requirements. Any increased rate of healing after treatment is due to the reduction of conditions inimical to the epithelial advance, thus permitting the epithelium to "grow" at its optimal rate.

DIET AND DENTAL CARIES

Concerning few topics have extreme differences of opinion been so vigorously defended as in respect to the etiology of dental caries. On the one hand it is stated emphatically that "a clean tooth never decays," the implication being that oral hygiene, including the vigorous use of the toothbrush and some of the almost numberless makes of dentifrices, will insure adequate protection against tooth decay. Naturally from this standpoint one thinks of a bacterial menace that needs to be constantly eradicated. Carbohydrates in particular have been designated at times as substances that lodge in dental crevices and furnish the pabulum for the development of acid-producing micro-organisms. The acid products of their growth are then held responsible for a chemical erosion of tooth surfaces. The most promising defenses against such a local condition are obvious. A recent popular writer [1] expands the etiologic possibilities so as to incriminate the quality of the saliva in certain persons and even the already overworked endocrine abnormalities. He states that rapid decay of the teeth may be due to some inherited disease, to poor nutrition, to some endocrine gland insufficiency, especially the thyroid, thymus, pituitary or parathyroids, or to an abnormal saliva; that the saliva should normally be slightly alkaline or neutral in reaction; if it is acid, it is abnormal; and that the mouth secretions may be acid from some mouth infection.

1. Osborne, O. T.: What Everyone Ought to Know, Springfield, Ill., Charles C. Thomas, 1929.

On the other hand, it is charged that dental caries is due primarily to improper tooth nutrition and development, making the latter closely dependent on abnormalities of diet. The dependence of the integrity of comparable bony structures, represented by the skeletal parts, on adequate diets presents an analogy that cannot be overlooked. Rickets and osteoporosis afford cogent illustrations. Some investigators insist that dental caries is actually controllable by the administration of sufficient vitamin D—a factor demonstrably potent in calcium metabolism in the body.

The advocates of the dietary control of dental caries will find interesting support in the recent reports of Boyd, Drain and Nelson [2] from the State University of Iowa. They secured the arrest of dental caries in children by the comparatively simple formula of supplying diets rich in their mineral and vitamin content. This means specifically that each child received cod liver oil, orange or tomato juice, milk, vegetables and fruits daily, in amounts designed to meet the requirements for vitamins and minerals. The protein allowance in every instance was at least a gram per pound of body weight. Whatever the factors essential for dental integrity, they apparently are supplied by these foods.

The outcome is the more striking in view of the circumstance that the children received otherwise widely varying diets. Some were on diabetic regimens. In one, calories were supplied principally as simple sugars, and fats were avoided as much as possible; in another, fats furnished most of the energy, and only enough carbohydrate was used to make the diets antiketogenic. It may well be asked why, if such comparatively simple food prescriptions are effective, caries is so common in childhood. These authors answer that children's diets are seldom as adequate as they appear at first glance. Even when children's menus are carefully planned, the foods that the child eats may be considerably different from those prescribed. Unless supervised, the child's diet will be governed by his food preferences, and foods which are not liked will not be eaten. The Iowa workers specifically exempt the saliva and bacterial causes of mouth acidity. They even add that the oral hygiene in the homes of many of their patients was not good. Some of the children with arrest of caries did not use a toothbrush while away from the hospital. Deposits of calculus occurred which in some instances were extensive, but the lack of oral cleanliness did not seem in any way to deter the arrest of caries. The subject is assuredly too complex to accept these experiences as the "last word." However, even at this stage of our limited knowledge it will do no harm to remember the Iowa dictum that, when the food intake is made adequate, caries will become arrested, and in other respects there will be evidences of better health.

2. Boyd, J. D.; Drain, C. L., and Nelson, Martha V.: Dietary Control of Dental Caries, Am. J. Dis. Child. **38**: 721 (Oct.) 1929. Boyd, J. D., and Drain, C. L.: The Arrest of Dental Caries in Childhood, J. A. M. A. **90**: 1867 (June 9) 1928.

Current Comment

THE HOROVITZ PROTEINS AND LIPOIDS AGAIN

THE JOURNAL has commented frequently on the "lipoidal substances" and "protein substances," marketed under various names by variously named firms. Always, apparently, the chemistry is performed by and the claims are made through A. S. Horovitz. In 1915 it was an alleged cancer cure, "Autolysin," [1] a poultice or extract made from a large number of herbs. Certainly "Autolysin" never achieved recognition as a "cure" or even a useful preparation for cancer. Then came the "Proteogens" of the William S. Merrell Company. The Council on Pharmacy and Chemistry, in 1918, declared these inadmissible to New and Nonofficial Remedies. The Proteogens were numbered, different ones being for the treatment of different diseases. These mixtures of vegetable proteins were exploited to physicians by a sad outpouring of pseudoscience so confused as hardly to be understandable. The Merrell Company dissociated itself from Horovitz but still markets the "Proteogens." Next Horovitz became identified with the Horovitz Biochemical Laboratories, with a line of "Protein Substances" similar to the "Proteogens," each claimed to be more or less specific for some disease. Now the successor to the Horovitz Biochemical Laboratories is the Lipoidal Laboratories, Inc. A number of supply houses act as agents for the Lipoidal Laboratories, Inc. "Gonolin," "Luesol," "Osmogen," "Arthritine," "Asthmazine" and other preparations similar in stated composition and therapeutic claims to the Proteogens are now promoted for use by doctors who think that the "bosh" in the circulars is good science because it is so confusing that it is not comprehensible. A circular for "Luesol," which is said to be "The Isotonic Proto-Lipoid Treatment for Syphilis in all Its Stages," explains that "The treatment of syphilis has now evolved into a biochemical problem of the lipoids," that "Lipoidal substances have been shown to possess strong biochemical affinities for the spirochetae pallida, destroying and disintegrating this organism, actually reaching the most hidden recesses of the body" and that "Luesol (L. L., Inc.) has triple action in syphilitic infection; firstly, absorbing of all syphilitic exudates; secondly, stimulating cellular resistances; thirdly, direct attack of the spirochetes and their toxins." "Gonolin," said to be "Proto-Enzyme Treatment for the Involvements in Gonorrhea," contains, according to the circular, "enzymes" which "neutralize the toxins or end products of the gonococcus." The nonspecific proteins contained are claimed to stimulate the production of phagocytes which "attack and ingest the starved gonococci, changing them into peptones and releasing these peptones osmotically into the blood stream," where they are "taken up by red blood corpuscles . . . carried . . . to the liver, where they are split by the hepatic hormones into fatty acids and urates, and . . . easily eliminated by the emunctories." Now who in the world—has ever proved that? And the claims for "Osmogen," "Arthritine" and "Asthmazine" are as bad or worse! When, if ever, will doctors learn to beware of the kind of science that promotes proprietary products by calling on weird and unestablished hypotheses? Some day perhaps our medical schools will place greater emphasis on the instruction of prospective physicians in the examination of evidence. On that day the astute exploiters who gain medical credence by pseudoscience alone will find their bait ineffectual because the crop of suckers will be smaller.

1. The Horovitz-Beebe Treatment for Cancer, editorial, J. A. M. A. **65**: 336 (July 24) 1915.

THE INFLUENZA DISCOVERY (?)

With little if any apparent warrant, it is again announced, for at least the tenth time in five years, that the causative organism of influenza has been discovered and that it is hoped to prepare a vaccine. There is thus far little or no evidence in scientific medical literature, or even in spoken addresses, to indicate that I. S. Falk, Ph.D., and his associates have progressed any further toward the solution of this problem than have workers in other parts of the world, now or in the past. Even the staid New York *Times* succeeded in confusing antitoxins, vaccines and similar scientific terms in a manner that can be explained only by the undue haste with which the announcement was rushed to the audience. The furor is inexcusable.

HEART DISEASE IN EARLY LIFE

Heart disease continues to increase in importance as a cause of death. Figures recently compiled by the Public Health Service [1] indicate that last year, in a group of states with approximately 25,000,000 population, the death rate from heart disease was 228 per hundred thousand. This is compared with rates of 106 from kidney disease, 105 from cancer and 100 from pneumonia. To this high rate various factors contribute, among them the conservation of life in the early age groups and the changing age composition of the population. Yet such explanations do not explain completely; especially when Dr. Clark emphasizes that "heart disease is particularly a disease of early life." About 75 per cent of all cases of heart disease, he asserts, develop in children under 10 years of age. Rheumatic infections are of the first importance in producing heart lesions in this age group. Unfortunately, a well planned preventive campaign must await more satisfactory knowledge of the etiology of rheumatism. On the basis of available knowledge it can be asserted that "growing pains" should no longer be taken lightly, and that in all children adenoids, tonsils and teeth should be kept under close supervision. Add to these precautions the best of care in convalescence after diseases of childhood, and there is little more that the family physician can do to prevent the onset of heart disease. The school nurse can extend the protecting arm of preventive medicine a further stage by her supervision in the schools and her follow-up work in the homes, both in bringing patients to the physician and in seeing that his instructions are obeyed.

1. Clark, Taliaferro: Heart Disease a Public Health Problem, Pub. Health Rep. **44**: 2463 (Oct. 11) 1929.

Association News

MEDICAL BROADCAST FOR THE WEEK

The American Medical Association Morning Health Talks and Evening Health Hints from Hygeia

The American Medical Association broadcasts daily at 10 o'clock, Central Standard Time, with the exception of Friday, when the health message is delivered at 9:45, over Station WBBM (770 kilocycles, or 389.4 meters).

The program for the week of December 23-28 is as follows:

December 23. "Planning a Christmas Dinner," by Dr. R. G. Leland.
December 24. "High Blood Pressure," by Dr. John M. Dodson.
December 25. Holiday.
December 26. "Growing Boys," by Dr. R. G. Leland.
December 27. "The Cure of Lepers in the United States," by Dr. John M. Dodson.
December 28. "Judging Health Information," by Miss Lois Stice.

Evening Health Hints from Hygeia, 8 o'Clock, Central Standard Time

December 23. Why Know About Tuberculosis.
December 24. Sources of Information About Tuberculosis.
December 25. When to Suspect Tuberculosis.
December 26. Cheap Advice.
December 27. Medical Shopping.
December 28. Learning by Experience.

ANNUAL CONGRESS ON MEDICAL EDUCATION, LICENSURE AND HOSPITALS

Supplement to the Program Published Last Week

The banquet to be given Monday night will have as its chief speaker Dr. Robert Maynard Hutchins, president of the University of Chicago. The chairman of the Council, Hon. Ray Lyman Wilbur, is expected to preside.

The tentative program prepared by the American Conference on Hospital Service is as follows:

MORNING SESSION

SYMPOSIUM ON HOSPITALS AND THE COST OF MEDICAL CARE

From the Point of View of the Hospital
Bert W. Caldwell, M.D., Executive Secretary, American Hospital Association, Chicago.

From the Point of View of the Hospital Staff
James B. Herrick, M.D., Professor of Medicine, Rush Medical College, Chicago.

From the Point of View of the General Practitioner
Arthur Tenney Holbrook, M.D., Milwaukee.

From the Point of View of the Layman
Wilford S. Reynolds, Executive Secretary, Council of Social Agencies, Chicago.

Discussion opened by Hon. Ray Lyman Wilbur, Secretary of the Interior, Washington, D. C., followed by Dr. L. L. McArthur, Messrs. Asa S. Bacon, Alfred C. Meyer and Charles Wardell, all of Chicago.

AFTERNOON SESSION

SYMPOSIUM ON HOSPITAL PROVISION FOR THE NEGRO RACE

Hospital and Outpatient Facilities for the Adequate Care of the Sick
Peter M. Murray, M.D., New York.

Providing Adequate Facilities for the Education of Colored Medical Students
Basil C. H. Harvey, M.D., Dean of Medical Students and Professor of Anatomy, University of Chicago.

Providing Adequate Facilities for the Education of Colored Nurses
Miss Adda Eldredge, Director of the Bureau of Nursing Education, Madison, Wis.

Discussion by Dr. D. J. Davis, Dean, University of Illinois College of Medicine, Chicago; Dr. Julian H. Lewis, Department of Pathology, University of Chicago, and Miss Belva L. Overton, Superintendent of Nurses, Provident Hospital, Chicago.

To the program for medical licensure the following article, to be illustrated by the stereopticon, has been suggested:

Examples of Fraudulent Diplomas or Other Credentials Submitted for License in California
Charles B. Pinkham, M.D., Secretary, California Board of Medical Examiners, Sacramento.

The *joint conference* of the State Hospital Associations of Wisconsin, Illinois, Indiana and Michigan is to be held at the Palmer House during the three days immediately following the program as set forth last week. Indeed, it is sufficiently a part of the Congress to enable those attending to obtain reduced railway fares on the return trip.

NOTES

All fixed papers should be such as can be presented in twenty minutes.

Those opening discussions are limited to five minutes; others, three minutes.

Kindly notify the Council promptly of any errors in the spelling of names or of preferences in the wordings of titles.

If any of the articles to be presented require the use of a stereopticon, kindly notify the Council.

Be sure to *obtain a certificate receipt* for your full fare paid to Chicago.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ALABAMA

Personal.—Dr. Crayton C. Fargason, Dadeville, has been appointed health officer of Tallapoosa County. Dr. Fargason succeeds Dr. William E. Wilson, who has been awarded a Rockefeller Foundation scholarship in public health.——Dr. William A. Stanley, Enterprise, has been made county health officer.——Dr. David D. Carr, Lafayette, has been appointed health officer of Chambers County, succeeding Dr. Charles W. McDonald, resigned.

The Physician's "Brother and Son Racket."—Last week THE JOURNAL, page 1897, published an item about impostors in Boston, Duluth, Minn., and Helena, Mont., who had impersonated physicians' sons in an effort to obtain money. Now, Dr. James A. Ward of Birmingham writes that a young man has been calling at the offices of his former classmates, stating that he was Dr. Ward's brother and asking to have a check indorsed or for a loan of money. Dr. Ward has no brother, and does not know any one by the names given. His classmates so approached should call a policeman instead of granting the impostor's request.

CALIFORNIA

Society News.—An outbreak of typhoid at Whittier amounted, November 4, to seven cases. The district health officer, Dr. Frank G. Crandall, believed the cases were due to raw milk, as all of the patients had been using raw milk from one dairy. Examination of the water supply showed it was free from pollution.——The Pasteur Society of Central California was addressed, December 4, at San Francisco by Karl F. Meyer, Ph.D., on his recent visit to European research centers. The address was followed by moving pictures of laboratories in Great Britain, a film on rabies, and two films on blood transfusion. About 175 persons attended the meeting.——A banquet was given at the health center at Montebello by members of the staff and health association in honor of the return to work of Dr. John L. Pomeroy, county health director, who has been seriously ill for some time.

CONNECTICUT

Training Physicians and Humanitarians.—The prime object of Yale University School of Medicine, according to the dean's annual report, is the training of physicians and humanitarians rather than "doctor-technicians." Progress in that direction was made at Yale during the last year; of first importance, Dean Winternitz says, was the formation of the human welfare group with the Institute of Human Relations as the integrating agent, bringing into close contact various university divisions engaged in the study of individual and social conduct. The university received gifts during the year equivalent to $9,900,000 to meet financial requirements aggregating $15,500,000 for the stabilization of the activities of this group. The Farnam Memorial Building, Lauder Hall and the Brady Memorial Laboratory were completed at a cost of $1,250,000, and the Raleigh Fitkin Memorial for Children, costing $600,000, is nearly ready for occupancy. Yale, in connection with this building progress, has also strengthened the work in psychiatry and mental hygiene by adding personnel in the fundamental sciences which underlie a study of the mind and by adding representatives of the various aspects of treatment and prevention of mental disease. These appointments have been announced in THE JOURNAL from time to time.

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FLORIDA

Society News.—Dr. Ralph N. Greene, Jacksonville, addressed the Suwanee River Medical Society, recently, on "Mental Diseases Pertaining to General Practice," and Dr. Lloyd J. Netto, West Palm Beach, addressed the Palm Beach County Medical Society on "Sympathetic System in Relation to Abdominal Pain.——Dr. Walter A. Weed, Lakeland, was elected president of the Florida Midland Medical Society at the recent meeting in Plant City.——Dr. James Q. Folmar has resigned as medical director at the state asylum for the insane at Chattahoochee.

INDIANA

Dr. Chen Becomes Director of Pharmacologic Research.—Dr. Ko Kuei Chen, known for research on ephedrine, has become director of pharmacologic research of Eli Lilly and Company, Indianapolis. Dr. Chen has a Ph.D. in physiologic chemistry from the University of Wisconsin and is a graduate of Johns Hopkins University Medical School. He was born in Shanghai.

Society News.—Dr. Elmer Funkhouser addressed the Indianapolis Medical Society, November 19, on "Cardiac Arrhythmia," illustrated, and Dr. Henry F. Beckman, "First Stage of Labor."—The Indianapolis Medical Society was addressed, November 26, by Drs. John W. Carmack on "Mastoiditis with Gastro-Intestinal Disturbance in Infants," and James H. Stygall on diagnosis and treatment of lung abscess. The society was addressed, November 3, by Dr. Stuart W. Harrington, Rochester, Minn., on diaphragmatic hernia. The meeting, December 17, was addressed by Drs. Ora K. McKittrick on "Treatment of Varicose Veins by the Injection Method"; Eugene B. Mumford on "Supracondylar Fracture of the Humerus," and Edmund B. Haggard, "Varicose Ulcers."——At the fourteenth annual meeting of the Indiana Society for Mental Hygiene, Indianapolis, December 16, Clifford R. Shaw of the Institute of Juvenile Research, Chicago, spoke on "Juvenile Delinquency and Community Background"; Dr. George M. Kline of the state department of mental diseases, Boston, on "Mental Examination of Offenders," and Dr. Frank Cregor, Indianapolis, on "Venereal Disease and Mental Health."——The Indianapolis Medical Society presented another case report program, December 10; among the cases were generalized carcinomatosis, Parinaud's conjunctivitis, and juvenile tuberculosis complicated by bronchial asthma.

KENTUCKY

Society News.—Twenty-one cases of scarlet fever had been reported in an outbreak at Hawesville, Ky., up to October 25.—The Jefferson County Medical Society was addressed, recently, by Dr. Harper E. Richey, Louisville, on spinal anesthesia.——An outbreak of twelve cases of scarlet fever was reported in Carlisle, November 1.——The Fayette County Medical Society was addressed, November 12, by Dr. Samuel B. Marks, Lexington, on "Otitic Sepsis."

Personal.—Dr. Omer F. Hume, who is superintendent of the Riverview Hospital, Irvine, won the annual golf tournament played during the recent meeting of the Kentucky State Medical Association at Louisville. Dr. Hume won the tournament in 1925.——Dr. Norman Westlund has been appointed health officer of Wayne County, succeeding Dr. James F. Young, who retires on account of the age limit.——Dr. Levy De Foe Whitaker has taken up his duties as full-time health officer of Muhlenberg County.

MICHIGAN

Dr. Todd to Give Beaumont Lectures.—The Wayne County Medical Society, Detroit, announces January 27-28 as the tentative dates of the next annual series of Beaumont lectures, which will be given by Dr. Wingate Todd, professor of anatomy, Western Reserve University School of Medicine, Cleveland. This is the ninth in the series of Beaumont lectures, which grew out of a fund set aside during the World War by members of the Wayne County Medical Society.

Children Unprotected from Diphtheria.—The Detroit Department of Health says that 153,000 children under 11 years of age in Detroit have been immunized against diphtheria. There are about 142,800 still unprotected. There have been no cases of diphtheria among the former group, but 1,805 cases with 222 deaths among the latter. Opportunities have been provided for parents to have their children immunized. More than 800 physicians in Detroit will give at certain hours toxin-antitoxin free of charge to those who cannot pay, or at $1 per injection for others. The health department (Cadillac 2810) will give a list of these physicians on application. The number of cases of diphtheria in Detroit for the week ended December 7 increased to eighty-eight from forty-eight for the previous week.

Society News.—Dr. Bronson Crothers, Boston, addressed a joint meeting of the Wayne County Medical Society and the Detroit Pediatric Society, December 3, on "Ventriculography in Fixed Lesions of the Central Nervous System in Children," illustrated with lantern slides.——The Michigan State Board of Registration in Medicine has moved its offices to 1010 Maccabee Building.——Dr. Martin H. Fischer, professor of physiology, University of Cincinnati College of Medicine, addressed the December 17 meeting of the Wayne County Medical Society, Detroit, on "Fundamental Principles in Feeding the Patient."——Dr. Alfred Adler, psychiatrist, of Vienna, will come to Detroit in January, it is reported, under the auspices of the Children's Fund of Michigan and of the Society for the Scientific Study of Character to give a series of lectures.——Dr. Willis S. Peck, Ann Arbor, addressed the Oakland County Medical Society, December 19, at Pontiac, on "The Physiologic Action of Physical Therapy Agents."

Portrait of Dr. Novy Presented to University.—Former students, colleagues and friends of Dr. Frederick G. Novy attended a meeting in Ann Arbor, December 9, to celebrate his sixty-fifth birthday, to present to the University of Michigan his portrait, and to present to him a volume in which were individual greetings from scientists and friends throughout the world. Dr. Novy has been on the faculty of the University of Michigan Medical School for forty-three years and, since 1902, the head of the department of bacteriology. Dr. Aldred Scott Warthin, head of the pathologic laboratory, presented the portrait, which was accepted by President Alexander G. Ruthven. Dr. Novy richly deserves the honor, not only for service to the university but also for his contributions to science. He is a native of Chicago. He graduated at Michigan, studied at the Pasteur Institute in Paris and under Robert Koch in Berlin, and was for years associated with the late Dr. Victor C. Vaughan, with whom he was co-author of the well known "Cellular Toxins."

MISSISSIPPI

Society News.—The Winona District Medical Association at its meeting in Grenada, November 19, was addressed by Drs. Frank S. Hill, Grenada, on infant feeding; Walter T. Swink, Memphis, Tenn., "Tropical Sprue," and Walter S. Lawrence, Memphis, "Indications for X-Ray and Radium in the Gynecologic Pelvis."

Personal.—Everett S. Sanderson, Ph.D., after spending the summer with the International Health Division of the Rockefeller Foundation in the Virgin Islands, has resumed work as head of the department of bacteriology and pathology at the University of Mississippi School of Medicine.——Dr. Hardie R. Hays, health officer of Jones County, has resigned on account of ill health.

NEW YORK

Hospital News.—The Rochester General Hospital opened a campaign, December 2, to raise $600,000 for a new outpatient building to replace one that has been in service about forty years, and for a new wing.

Society News.—The Medical Society of the County of Nassau cooperated with the county public health association in arranging the program for a public health institute, which was held at Mineola, December 4-5. Among the speakers were Drs. Haven Emerson of the faculty of Columbia University College of Physicians and Surgeons, New York; Roy D. Grimmer, president of the Medical Society of the County of Nassau; William H. Ross, president elect of the New York State Medical Society, and Frank Overton, executive editor of the *New York State Journal of Medicine*, and representatives of the American Society for the Control of Cancer, parent-teacher associations, the Red Cross, and other civic organizations.

New York City

Personal.—Dr. Shirley W. Wynne, city health commissioner, was a guest of honor at the annual dinner of the Maryland Tuberculosis Association, Baltimore, November 19.——Funds are being collected for a $100,000 Royal S. Copeland Foundation for Public Health and Hygiene at the Flower Hospital and the New York Homeopathic Medical College, where Dr. Copeland was dean and professor of ophthalmology from 1908 to 1918.——Dr. L. Schwartz of the Institute of Child Guidance in this city is to go to Detroit to be director of the study to be made by the Institute of Human Relations of Yale University on the relationship between home and neighborhood influence and juvenile delinquency which will be undertaken in connection with the Detroit juvenile court.——Dr. Theobald

Smith, director, department of animal pathology, Rockefeller Institute for Medical Research, has been awarded the gold medal of the Holland Society of New York.——Dr. Max Cutler, who has been placed in charge of the New York City Cancer Institute, will direct also cancer research in the department of hospitals.——Dr. Henry H. Schultz has accepted a position on the staff of the state hospital at Fergus Falls, Minn.——A farewell banquet was given to Dr. Gustav Bucky at the Hotel Roosevelt, December 11, previous to his departure for Berlin.

Opening of State Psychiatric Institute.—The new eleven story, $2,000,000 New York State Psychiatric Institute and Hospital, a unit of the Medical Center at Broadway and One Hundred and Sixty-Eighth Street, was formally dedicated, December 3, and opened to the public. The institute and hospital is the outgrowth of a psychiatric institute which has been operating in a much smaller way for twenty-five years under the state department of mental hygiene. It has now one of the best equipped buildings for the study and treatment of mental disease. The tower is occupied by laboratories for research; the twelfth floor by the library and museum, and the tenth and eleventh floors by the outpatient department; from the fourth to the ninth floors are rooms and wards. The second and third floors have living rooms for the personnel. At the dedication was a group of psychiatrists from Europe and America. The following institutions were represented: University of Zurich; University of Paris; University of Marburg, Marburg, Germany; International Psychoanalytical Association of London; University of Glasgow; University of Munich; University of Vienna; Johns Hopkins University; Jefferson Medical College, Philadelphia; St. Elizabeth's Hospital, Washington, D. C.; University of Wisconsin; Harvard University, and the University of Colorado. Dr. Eugen Bleuler of Zurich, in an address, expounded the theory, according to the *New York Times*, that acquired characteristics are transmitted through successful generations. Dr. Henri Claude of Paris opposed the view that physical changes in the brain account for such symptoms as hallucinations. Dr. David K. Henderson of the University of Glasgow spoke on "Psychiatry and Its Relation to Criminal Law," and Dr. Edward A. Strecker of Jefferson Medical College, on "Psychiatric Imponderables." Other speakers were Drs. George Kirby, director of the institute; Frederick W. Parsons, commissioner of the department of mental hygiene; William Darrach, dean and professor of clinical surgery, Columbia University College of Physicians and Surgeons; Walter W. Palmer and Frederick Tilney. The staff of the psychiatric institute and hospital will comprise seventy-nine nurses and attendants in the wards, five psychiatrists, research associates and assistants in psychiatry, chemistry, bacteriology, internal medicine, psychology, occupational therapy and social service. The outpatient department is already in service; resident patients will not be accepted for several weeks.

OKLAHOMA

Society News.—The Stephens County Medical Society, was addressed, October 29, by Drs. Antonio D. Young and Willis K. West, Oklahoma City, on chorea, and the open treatment of fractures of the lower extremities, respectively.——Dr. Ray M. Balyeat, Oklahoma City, addressed the Yorkville County Medical Society, New York, November 18, on "Importance of Pollen as an Etiologic Factor in Allergic Diseases in the Southwest Compared with Other Sections of the United States."——Dr. Abraham L. Blesh, Oklahoma City, addressed the Stephens County Medical Society, recently, on "Surgical Diagnosis."—— The Muskogee County Medical Society was addressed, October 4, by Dr. Hugh L. Dwyer, Kansas City, Mo., on "Trends of Immunization"; Dr. Ray M. Balyeat, Oklahoma City, on "Anaphylaxis and Serum Sickness Prevention," and Dr. Robert F. Lischer, Mascoutah, Ill., on "A Pen Picture of the Country Doctor."——There were 1,356 deaths from pulmonary tuberculosis reported to the Oklahoma State Department of Health during 1928 and 1,350 during 1927.——At the semiannual meeting of the Southeastern Oklahoma Medical Association, McAlester, December 11, clinics were held in the morning at the Albert Pike Hospital and in the hospital of the Oklahoma State Prison. Later addresses were presented by Drs. John F. Park on "Ludwig's Angina"; James M. Byrum, Shawnee, on "Treatment of Acute Peritonitis"; Joseph S. Fulton, Atoka, on "Organized Medicine," and Frank L. Watson, "Treatment of Compound Fractures." The morning clinics were given by Drs. Watson, James E. Davis, Louis C. Kuyrkendall and Leonard S. Willour.

PENNSYLVANIA

Society News.—The Lehigh County Medical Society was addressed, December 10, by George Gordin on "Economics of Medicine from an Accountant's Point of View."——Dr. Richard C. Norris, Philadelphia, addressed the Berks County Medical Society, December 10, on "Modern Technic in Conduct of Painless Labor."

Personal.—Dr. Lawrence Litchfield, Pittsburgh, was tendered a testimonial dinner, December 6, on the eve of his departure south for the winter; about 100 physicians attended, and among the speakers were Dr. William S. Thayer, Baltimore, and Dr. Edward B. Heckel, Pittsburgh, Past President and chairman of the Board of Trustees of the American Medical Association, respectively.——Dr. George L. Laverty won the Seibert Memorial Prize of $500 of the Harrisburg Academy of Medicine, in which organization he has been chairman of the legislative committee for the past year.

Philadelphia

Society News.—The Philadelphia Pathological Society, which held its December meeting in the auditorium at Jefferson Medical College, inspected the new laboratories of the college. ——Alpha Kappa Kappa, an international medical fraternity, will hold its twenty-fifth convention at the Benjamin Franklin Hotel, January 2-4.——The Philadelphia County Medical Society announces that it has not entered into any arrangement for publication of the book "Philadelphia, World's Medical Center."

Pediatric Society Offers Prize.—To stimulate interest in pediatrics, the Philadelphia Pediatric Society announces a competition for practitioners of less than six years since graduation who live in the Philadelphia area. The prizes will be $100 and $50. The subjects must be of sufficient merit to earn the award, and the investigations and studies must be limited to pediatrics. Papers should be in the hands of the secretary not later than Oct. 1, 1930. Further information will be given by the secretary, Dr. John D. Donnelly, Bala-Cynwyd, Pa.

SOUTH CAROLINA

Society News.—Dr. Marion H. Wyman, Columbia, was made president of the Urological Association of South Carolina at the recent annual meeting in Sumter.——The Pee Dee Medical Association was addressed, November 12, at Florence by Drs. Olin B. Chamberlain, Charleston, on syphilis of the nervous system; Robert L. Gardner, Chesterfield, on pellagra, and Paul E. Sasser, Conway, on "Diphtheria Prophylaxis with Toxoid or Antitoxin."

Personal.—The Beaufort County health officer, Dr. Hugh B. Senn, was rescued in October by the state board of health oyster bed inspection boat, after having been marooned for several days at Bluffton during a period of high water.—— Dr. Edgar Thompson, captain, medical corps, U. S. Navy, in command of the naval hospital at Charleston, recently passed the state board examination for license to practice law. Captain Thompson has been in the navy for about thirty-five years. While serving near Washington, he undertook the study of law at George Washington University together with his son, both graduating in the class of 1929. Captain Thompson does not anticipate entering the practice of law.

TENNESSEE

Society News.—At the semiannual meeting of the Middle Tennessee Medical Association, Lebanon, November 15, Dr. John R. Gott, Murfreesboro, was made president for the ensuing year, and Shelbyville was selected for the next meeting place in May.

Personal.—Dr. William W. King has assumed charge of the Carter County Health Department.——Dr. Walter E. Garrey, professor of physiology, Vanderbilt University School of Medicine, Nashville, has been elected a member at large on the medical division of the National Research Council.

Health at Memphis.—Telegraphic reports to the U. S. Department of Commerce from sixty-three cities with a total population of about thirty million, for the week ended Decem-

ber 7, indicate that the highest mortality rate (22.8) was for Memphis, and that the mortality rate for the group of cities as a whole was 13.2. The mortality rate for Memphis for the corresponding week last year was 25.6 and for the group of cities, 13.3. Caution should be used in the interpretation of weekly figures as they fluctuate widely. The fact that some cities are hospital centers for large areas outside the city limits or that they have a large negro population may tend to increase the death rate.

VIRGINIA

Society News.—The thirty-fourth annual convention of the Seaboard Medical Association of Virginia and North Carolina was held, December 3-5, at Newport News. Dr. Howard A. Kelly, Baltimore, spoke on "The Doctor as a Moral Leader in the Community"; Dr. Frederick M. Hodges, Richmond, on "The X-Rays in Treatment of Furunculosis, Erysipelas, Cellulitis and Parotiditis"; Dr. William L. Harris, Norfolk, on "What Do We Know About the Thymus?" and Dr. James W. Sayre, Newport News, on "Epidural Sacral Anesthesia in Surgery of the Perineum."

Birthplace of Ephraim McDowell.—The committee of the Medical Society of Virginia, appointed in 1927 to erect a marker to commemorate the birth of the pioneer surgeon, Dr. Ephraim McDowell, has completed its work. On or near the spot where stood the house in which he was born in Rockbridge County, about 8 miles north of Lexington, has been erected a bronze tablet, supported on a base of native blue limestone. The inscription reads:

NEAR THIS SPOT
DR. EPHRAIM McDOWELL
WAS BORN NOVEMBER 11, 1771
THE FATHER
OF ABDOMINAL SURGERY
BEGINNING MEDICAL STUDY
IN STAUNTON, VIRGINIA
CONTINUING IT IN
EDINBURGH, SCOTLAND
HE LATER RECEIVED
THE HONORARY DEGREE
FROM THE UNIVERSITY OF MARYLAND
POSSESSING THE HIGHEST ATTRIBUTES
OF THE PHYSICIAN AND SURGEON.
HE WAS A PIONEER
IN WORK WHICH HAS SAVED
THE LIVES OF COUNTLESS THOUSANDS.

ERECTED BY
THE MEDICAL SOCIETY OF VIRGINIA
1929

While he was still a small boy, Dr. McDowell's parents moved to Danville, Ky., where he grew up and achieved fame.

GENERAL

Society News.—At the annual meeting of the American Roentgen Ray Society, December 6, in Toledo, Dr. Harry M. Imboden, New York, was made president; Dr. Alexander B. Moore, Rochester, Minn., president-elect, and Dr. John T. Murphy, 421 Michigan Street, Toledo, Ohio, secretary, reelected. The next annual session will be held at West Baden, Ind., Sept. 23-26, 1930.

Unauthorized Agent Solicits Among Physicians.—A man, claiming to be a representative of the *Railway Employees Journal*, has been soliciting among physicians and has accepted money from them for advertising purposes. The Benefit Association of Railway Employees states that the *Railway Employees Journal* does not solicit or accept advertising, and that any such solicitation is entirely unauthorized. Physicians should notify the Benefit Association of Railway Employees, P. O. Box 790, Chicago, Ill., when approached by any one for this purpose.

Pan-Pacific Medical Congress.—During the meeting of the Pan-Pacific Surgical Congress recently in Honolulu, plans were made to hold there in August, 1933, a Pan-Pacific Medical Congress in which will take part the Australasian branch of the British Medical Association, the Pan-American Medical Association and the Far Eastern Tropical Medical Association. Dr. Fred H. Albee, New York, was requested to be the American chairman, and to secure the cooperation of the profession in Canada, Latin America and the United States. A Pan-Pacific Medical Congress was planned some years ago and invitations were issued, but it was postponed. The congress will be called by the Pan-Pacific Union. The Pan-Pacific Surgical Congress has been made a permanent organization.

Nonmagnetic Yacht Wrecked in Samoa.—While on her seventh cruise, the nonmagnetic yacht *Carnegie* exploded and burned in Apia Harbor, Samoa, November 29, causing the death of the captain, J. P. Ault, and the loss of five other vessels moored nearby. According to the Chicago *Tribune*, the *Carnegie* left Washington, D. C., last May on a three-year cruise to make a magnetic survey of the oceans. She put into San Francisco harbor, July 29, to take part in a celebration of the Carnegie Institution's silver anniversary. The *Carnegie* was built in 1909 without any steel or iron being used in its construction. It had an unusual value in scientific studies of the earth's magnetism. The cruise which ended disastrously in Samoa was to have ended in Washington in 1931 (THE JOURNAL, July 14, 1928, p. 106).

The Nation's Death Rate—Heart Disease Leads.—The U. S. Department of Commerce announced, December 11, that the death rate for the registration area of the United States for 1928 was 12 per thousand of population, as compared with 11.4 in 1927. In the list of increases in rates for the year heart disease leads, followed in order by cerebral hemorrhage and softening, nephritis, diabetes mellitus, cancer, influenza and pneumonia. The deaths from these six conditions account for considerably more than half of the total number of 1,378,675 deaths which occurred in the registration area in 1928. The significant decreases noted in the death rates were for tuberculosis, congenital malformations and diseases of early infancy, whooping cough, diarrhea and enteritis, acute anterior poliomyelitis, typhoid and scarlet fever. The death rate from accidents increased from 78.4 to 79.2 per hundred thousand of population, accidental drowning and automobile accidents showing the greatest individual increases. The death rate from railroad accidents decreased from 6.4 to 5.9, and from mine accidents from 2.5 to 2.3. The registration area in 1928 comprised forty-four states, the District of Columbia and ten cities in nonregistration states, or 95.4 per cent of the population of the United States.

The Automobile Mortality Curve.—If a chart were made with the figures on automobile accidents published by the U. S. Department of Commerce, the death rate would be represented by a line steadily rising from 15.7 per hundred thousand of population in 1924 to 17 in 1925; to 17.9 in 1926; to 19.5 in 1927 and to 20.8 per hundred thousand of population in 1928 in the registration area of the United States. On this basis the number of deaths due to automobile accidents in 1928 for the whole country is estimated at 24,900. These do not include 2,041 deaths due to the collision of automobiles with railroad trains, nor 542 due to collisions with street cars. When these are added to the 23,765 deaths in the registration area caused by automobiles, the total would be 26,348, and the death rate would be raised from 20.8 per hundred thousand of population to 23. Automobile deaths now constitute 1.9 per cent of all deaths and 29 per cent of all deaths from accidents. In 1925 the number of such deaths constituted only 1.6 per cent of all deaths and 23.9 per cent of all deaths from accidents. The department of commerce announces that 839 deaths due to automobile accidents were reported from seventy-eight large cities of the United States for the four weeks ended Nov. 30, 1929. This number compares with 738 deaths during the four weeks ended Dec. 1, 1928. For the fifty-two week period ended November 30, the total automobile deaths in these cities was 8,528, giving a rate of 25.9 per hundred thousand of population. That was an increase of 15 per cent in the rate in a single year.

Protection Against False Advertising.—The activities of the Food, Drug, and Insecticide Administration for the fiscal year 1929 were reported to the secretary of agriculture, November 29, by Walter G. Campbell, director of the regulatory work of the department. This is the second annual report of the administration, which since July 1, 1927, has been responsible for enforcement of the food and drugs act, the tea act, the naval-stores act, the insecticide act, the import milk act, and the caustic-poison act. Mr. Campbell said:

> The well defined policy of preventing infractions of the six laws through cooperation of the industries concerned was adhered to in the year. From the earliest days of the enforcement of the food and drugs act, under the Bureau of Chemistry, it was found that a cooperative policy with the food industries, with prosecution and seizure action as a necessary adjunct where educational measures failed, offered a most effective means of affording the maximum protection to the American consumer.

Experts of the administration went into many commercial canning plants to explain new methods for detecting the presence of objectionable material in foods. Warning notices were broadcast to the trades concerned when their practices were found to be contrary to the law. Warnings have unhesitatingly been followed by seizure and prosecution where educational means proved ineffective. One of the most active campaigns was launched to prevent deception of the public through the sale of falsely labeled medicinal preparations, particularly the alleged remedies for influenza which appeared on the market in large quantities in the epidemic of 1928. Another feature of this particular campaign was the cooperation developed with the Federal Trade Commission, which is empowered by law to control false advertising, whereas the administration can pro-

ceed only against false labeling. The result of this cooperation was that the sale of medicines under promises of impossible cures has been curtailed. In all, there were 901 seizures and 309 prosecutions under the food and drugs act during the fiscal year. The largest group of seizures, 276, with thirty-three prosecutions, is listed for remedies under drugs. In all foods and food products there were 499 seizures and 211 prosecutions. On the subject of the import milk act, Mr. Campbell reports as follows:

> Although final figures for the entire year are not available, it is estimated that more than 30,000 cans of milk and cream were excluded from entry for such infractions of the law as high bacterial content, high temperature, improper tagging and production under unsanitary conditions.

Medical Bills in Congress.—S. J. Res. 93, introduced by Senator Heflin, Alabama, proposes to provide for the erection, in the District of Columbia, of a monument to Major Gen. William Crawford Gorgas in commemoration of the services rendered by him to humanity. S. 2359, introduced by Senator Jones, Washington, proposes to convert Veterans' Hospital number 94 at American Lake, Wash., from a neuropsychiatric hospital to a general medical and surgical hospital. S. 2414, introduced by Senator Copeland, New York, proposes to authorize the surgeon general of the army, the surgeon general of the navy, and the surgeon general of the public health service to send a joint exhibit from their departments to the International Hygiene Exhibition at Dresden, Germany, May 6-Oct. 1, 1930. S. 2556, introduced by Senator Norris (by request), Nebraska, proposes to establish a hospital for the care and treatment of all persons charged with or convicted of offenses against the United States who are or shall become insane, afflicted with an incurable or chronic degenerative disease, or so defective mentally or physically as to require special medical care and treatment not available in an existing federal institution. H. R. 7410, introduced by Representative Graham, Pennsylvania, is the companion bill in the House. H. R. 6138, introduced by Representative McKeown, Oklahoma, proposes to amend the World War Veterans' Act to create a conclusive presumption of service origin for paralysis, paresis or blindness. H. R. 6300, introduced by Representative Dyer, Missouri, proposes to establish in the Department of the Interior a laboratory for the study of the abnormal classes. H. R. 6346, introduced by Representative Zihlman (by request), Maryland, proposes to prohibit experiments on living dogs in the District of Columbia or in any territory or insular possessions of the United States. H. R. 6984, introduced by Representative Rogers, Massachusetts, proposes to authorize an appropriation of $1,400,000 for the erection by the director of the veterans' bureau of a new hospital and diagnostic center at Boston. H. R. 6996, introduced by Representative Johnson, South Dakota, proposes to provide for the establishment of a commissioned medical service in the U. S. Veterans' Bureau. H. R. 6798, introduced by Representative Mead, New York, proposes to extend from Jan. 1, 1925, to Dec. 31, 1928, the period within which if tuberculosis is contracted by World War veterans it is presumed to be of service origin.

Revision of List of Causes of Death.—Thirty-four countries were represented at the fourth decennial conference for the Revision of the International Classification of Causes of Death in Paris in October. There were seven members in the American delegation. Important developments of the conference, as noted in the Statistical Bulletin of the Metropolitan Life Insurance Company, were as follows: 1. Consideration was given, for the first time, to the troublesome subject of classifying jointly reported causes of death. Heretofore these international conferences had limited themselves to a system of classifying singly reported causes of death. The conference recognized this year that in the United States the codification of joint causes has been followed and this country was invited to take steps toward collecting and comparing all existing codes relating to joint causes with a view to determining how to obtain more uniform methods by the several countries. 2. Changes were made in the classification of deaths from cancer. Cancers of the pharynx henceforth will be classified along with those of the buccal cavity. Cancers of the duodenum will be studied along with those of the stomach, liver and biliary passages. New rubrics were added to provide for separate tabulation of cancers of the respiratory system and male genital organs. 3. The conference made changes in connection with heart and circulatory diseases, separating the classification of the valvular and muscular heart diseases in the mortality statistics. Gangrene, which heretofore was allocated to diseases of the skin and cellular tissue, has been transferred to the circulatory disease class. 4. A fundamental change, the Statistical Bulletin says, was made in regard to diseases of pregnancy, childbirth and the puerperal state. From now on deaths due to puerperal septicemia accompanying abortions or miscarriages will be classified as due to abortion but will be distinguished from all other deaths from abortion. This will make comparison possible between the mortality from puerperal septicemia with the death rates of former years. 5. The classification of fatal accidents received much attention by the commission largely through the insistence of the American delegation and it recognized the fact that the modern safety movement should have more data than are now available concerning fatal accidents. As a result, it is hoped that countries which have the necessary statistical equipment will henceforth incorporate in mortality statistics more detailed information about fatal accidents than was included heretofore.

Government Services

Annual Report of Prohibition Commissioner

The United States is divided into twenty-five districts for the purpose of administering the prohibition laws. District 1 comprises some of the New England states; the districts are numbered consecutively, proceeding westward. On June 30, 1929, there were 4,664 permanent and thirty-five temporary employees on the rolls of the bureau of prohibition, which was a few less than at the close of the previous fiscal year. The revised official prescriptions used by physicians for prescribing medicinal liquor, Commissioner Doran says, have proved successful; he says it is practically impossible to counterfeit them. Prohibition agents made 66,878 arrests in the fiscal year and seized 7,299 automobiles valued at nearly $3,000,000 and boats valued at about $261,000. The work of these agents resulted in the conviction of 56,546 persons, of whom 19,074 were given jail sentences. The courts imposed fines amounting to more than $7,000,000 and sentences aggregating 7,443 years. Field laboratories which have been established in the large cities during the fiscal year examined 111,448 samples. Several years ago denatured alcohol was a source of considerable illicit liquor, but the diversion of alcohol of this kind for beverage purposes has practically ceased, Mr. Doran says. During the year there was withdrawn from bond, free of tax, for denaturization 182,778,996.1 proof gallons of alcohol and rum, which was considerably more than was withdrawn for that purpose in the previous fiscal year. The total production of wine during the year was 11,381,990.43 gallons, an increase of nearly 6,500,000 gallons over the preceding fiscal year. On June 30, 1929, there were 23,138,754.99 gallons of wine on hand at bonded wineries and storerooms. The section of the report which concerns enforcement of the narcotic laws notes that there were 5,193 convictions under the Harrison Narcotic Act and smoking opium act for which the court imposed sentences aggregating more than 11,141 years and fines amounting to about $219,000. Commissioner Doran believes that the control of legal importation, manufacture and distribution of narcotics is reasonably effectual and that the quantity of narcotic drugs of domestic manufacture which is diverted to illicit use is comparatively negligible. On June 30, 1929, there were registered under the Harrison Narcotic Act, among others, 291 persons as importers and manufacturers; 51,568 as retail dealers and 146,588 as practitioners.

Annual Report of St. Elizabeth's Hospital

A steady increase in the number of patients under treatment at St. Elizabeth's Hospital, the government hospital for the treatment of the insane at Washington, D. C., is shown in its annual report. At the close of the year ended June 30, the number of patients in the hospital was 188 larger than at the beginning of the year. The total number under treatment during the year was 4,899; total discharges, 316; total deaths, 252; daily average population, 4,202. During the year, 513 men and 148 women, a total of 661, were admitted. Of these 550 were citizens by birth and sixty-eight by naturalization; twenty-seven were aliens, and the citizenship of sixteen was undetermined. Of the number treated during the year, 2,719 were white and 702 were colored males, while 912 females were white and 566 colored. A 1,500 bed addition to the hospital is planned. The surgical building now under construction constitutes the first 200 beds of this addition. The report reveals that there has been a continuation of the successful treatment of paresis by malarial inoculation. The hospital has cooperated with Johns Hopkins University in the inauguration of research in the treatment of carcinoma. The research experience of members of the Johns Hopkins University Hospital has developed an interesting absence of tuberculosis in patients who died of malignant disease and concurrently an interesting absence of malignant disease in those who died of tuberculosis. A few showed a combination of the two diseases, but the combination

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was so rare as to make it seem worth while to determine clinically whether or not these conditions were antagonistic in life. Further research, therefore, was undertaken by treating malignant disease by injection of special types of tuberculous serums. The hospital has been treating several cases, the report says, with some encouraging results. Further reports will be made on these cases after additional developments. During the epidemic of influenza and grip of last winter an opportunity was afforded the hospital to demonstrate the efficacy of diathermia in the treatment of the pneumonias which complicated the primary disease. It would seem, the report continues, that this method of treatment has proved its worth. The disease was practically aborted on the first or second day in a number of cases, and in many others the time was shortened to three or four days, the termination of the process being produced by crises in nearly all of the cases. The report reiterates the hospital's emphasis on the need for "a complete revision of the lunacy legislation in the District of Columbia," pointing out that "as compared with this type of legislation throughout the United States, the laws covering commitment and discharge in the district are very backward."

Annual Report of Public Health Service

Unlike the reports of the surgeon generals of the army and navy, the annual report of the U. S. Public Health Service is bound in permanent form. The fifty-eighth annual report of the service covers the year ended June 30, 1929, and the one hundred and thirty-first year of the existence of the service. In an interesting summary of disease conditions, Surgeon General Cumming states that 38,000 cases of smallpox occurred in the United States in the calendar year 1928. It seems strange, he continues to say, that year after year more cases of smallpox are reported in the United States than in any other country in the world except British India. More cases of meningococcus meningitis were reported during 1928 than for any year since 1918. The number of deaths from pellagra in forty-three states increased from 4,794 in 1926 to 6,652 in 1928. The pellagra death rate was highest in South Carolina. Four hundred and eighty cases of tularemia with eight deaths were reported in the year 1928. There were many cases, it is said, which were not reported. Typhoid showed a new low death rate during 1928. The mortality from typhoid has decreased since the beginning of this century from a rate of 34 per hundred thousand of population to 4.8 in forty-three states, a reduction of 86 per cent. A new low record for 1928 was shown also for diphtheria and for tuberculosis, the latter in forty-two states being 77.5 per hundred thousand of population, the lowest general tuberculosis death rate ever recorded by the public health service. Experience has shown, Dr. Cumming says, that it may be expected throughout the greater part of the country that about one paralytic case of infantile paralysis will occur between the first day of December and the last of June each year and in the other six months about four to fourteen cases. The maximum incidence is reached in mid September. While the reports for Brill's disease (mild typhus fever), are incomplete, the disease prevailed especially in the Southeastern states during 1928. There were 143 cases and twelve deaths reported. The public health service kept up a constant interchange of sanitary information with other nations through the International Office of Public Health at Paris, the Pan-American Sanitary Bureau and the Health Section of the League of Nations during the fiscal year. As previously reported in THE JOURNAL, a severe outbreak of yellow fever occurred during the year in Rio de Janeiro, Brazil; cases were reported also in Colombia. The epidemic of plague in India decreased and in the early months of 1929 the plague situation in nearly all ports of the world was more favorable than in previous years. Plague continues to prevail in some South American countries. The annual report takes up such other work of the bureau as the medical examination of aliens, the narcotic division which was created during the last year, rural health work, cooperative work with state health departments, collection of reports on communicable disease, and scientific research which is carried on largely at the Hygienic Laboratory. It is difficult to secure enough health officers for the U. S. Public Health Service. During the fiscal year, the number of resignations was greater than any previous year in the history of the service. The commissioned personnel was reduced sixteen, by resignation, two by deaths and four through officers being placed on waiting orders because of physical disabilities. Although the examination for entrance into the service was widely announced through medical journals and notices were sent to hospitals and medical schools throughout the country, only thirty-nine physicians with the requisite qualifications appeared for the examination held April 29. Nineteen of these successfully passed, but three of them declined to accept commissions. Thus, there were only sixteen additions to the regular corps as compared with twenty-two separations during the year. Dr. Cumming believes that the difficulty of securing trained young physicians for this work is due in large measure to the low compensation provided by law for the entrance grade of assistant surgeon and among his recommendations he emphasized the need of legislation to increase the compensation of commissioned medical officers. The aggregate number of commissioned officers, June 30, 1929, was 236 and the number of reserve officers on active duty, July 1, 1929, was sixty-five.

Change of Station in the Navy

Lieut. Comdr. Andre B. Lee has been transferred to the navy recruiting station, Seattle; Lieut. Comdr. Joel J. White has been assigned to duty involving flying at the U. S. Navy Medical School, Washington, D. C.; Comdr. Eugene A. Vickery has been relieved of all active duty and ordered home, effective about November 21; Lieut. George Wilson has been transferred from the U. S. S. *Beaver* to the American Legation, Peiping, China; Comdr. John T. Kennedy has been transferred to the marine recruiting station, Chicago; Capt. Middleton S. Elliott has been assigned to additional duty at the thirteenth naval district, Puget Sound, Washington; Capt. Robert E. Hoyt has been transferred to the navy hospital, Portsmouth, N. H.; Lieut. Carroll Hungate to Boston; Capt. Rand P. Crandall, relieved from all active duty and ordered home about November 21; Lieut. Comdr. Frank R. Bealer, from navy training station, San Diego, Calif., to U. S. S. *Rochester*, about December 31; Lieut. Ernest D. Davis, Jr., from navy yard, Washington, D. C., to U. S. S. *Wyoming;* Lieut. Comdr. Horace R. Boone to the National Guard, Nicaragua, about December 1; Lieut. Clinton G. DeFoney has been transferred to the navy air station, Pensacola, Fla., effective about December 1.

Annual Report of Surgeon General of Navy

Seventy-two persons belonging to the navy drowned in 1928, according to the annual report of the surgeon general for the year ended June 30, 1929. Fifty-two of these were "within command" and twenty on leave or liberty when drowned. There were thirty-eight admissions to sick report on account of war casualties incurred in China or during operations of the marine corps in Nicaragua. The mortality rate for the navy for the year was 4.18 per thousand, a rate slightly lower than for the preceding year. The deaths totaled 485. The chief disaster was an explosion on board the U. S. S. *Whitney*, which injured thirteen enlisted men, of whom five died. Aeronautic activities were responsible for the death of twenty navy officers, seven marine officers, six navy enlisted men and six marine corps enlisted men. The general admission rate to sick report, all ships in commission, was 551 per thousand, as compared with 568 in 1927, as a result of the prevalence of common infectious diseases of the respiratory type and to higher rates from malaria, diseases of the ear, nose and throat, parasitic skin diseases, diseases transmitted by intestinal discharges, nonvenereal diseases of the genito-urinary system, and dental diseases. The outbreak of influenza was responsible for sixteen deaths last year, as compared with twenty-five deaths in the previous year. There was an increase in cerebrospinal fever from 48 per hundred thousand to 75. A total of 932,839 days of treatment was spent in naval hospitals. That figure means the daily average of 2.2 per cent of the personnel under treatment in hospitals. It also indicates, the report says, an average of eight hospital days for all persons in the navy; 1,644 enlisted men of the navy and 309 enlisted men of the marine corps were invalided from the service by reason of disease. There were seventy-eight new navy medical officers commissioned during the year, while forty-four were separated from the service: thirty by resignation; nine by retirement; four by death, and one dropped. Of the 249 candidates authorized to appear for examination for appointment in the navy medical corps in January, eighty-four were found qualified, but six of them did not accept their commissions. The medical department continued to assign medical officers to graduate courses of instruction at civilian medical centers, but a shortage of commissioned officers prevents the assignment of as many as the bureau would like to assign. A new navy hospital is particularly needed at Philadelphia, where the buildings are all of the temporary type. The city of Philadelphia has offered a tract of 28 acres as a site for a new naval hospital. There is urgent need, the surgeon general says, for permanent structures for the hospital at Great Lakes, Ill., the naval training station near Chicago. More than half of the patients in the navy hospital at Washington, D. C., are still housed in temporary buildings.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Nov. 23, 1929.

A Hospital Reform: Abolition of Washing at the Dawn

One of the discomforts of hospital life for many patients is being aroused at an early hour to undergo the usual washing. The Middlesex Hospital has decided to abolish this evil and has introduced a new rule by which all patients are to be given breakfast not earlier than 7 a. m. and are not to be washed or disturbed before this hour, except for urgent medical reasons. It is felt that while early rising may be commendable for persons in health, for the sick any routine which curtails their sleep may be detrimental. For this reform a redistribution of the duties between the day and the night nursing staffs has been necessary and also the rule that the visits of the medical officers shall not begin before 10 a. m. The hospital authorities believe that their example will be followed throughout the country and the medical press has warmly approved of the reform. The matron has been anxious for some time to effect this alteration. No one likes being disturbed too early in the morning, especially the sick, who often get their best sleep between 4 and 5, at which time washing used to begin. This was known to be highly unsatisfactory but nursing administration seemed to stand in the way of any change. Now that the staff has been redistributed, no increase in numbers has been necessary. Another advantage is that there is not a long interval between waking and breakfast.

The Passage of Infection from the Nasal Cavities to the Brain

The committee on vaccination appointed in 1926 by the ministry of health in conjunction with the medical research council was requested to report on methods available to diminish any risks. In 1928 the committee reported that in 1923 deaths of recently vaccinated children were recorded in terms suggestive of an infection of the nervous system other than convulsions, and that although the occasional occurrence of nervous symptoms following vaccinia was as old as the practice of vaccination, fatal nervous complications did not appear to have been recorded. As to the nature and origin of these nervous manifestations, the committee thought that a knowledge of the paths by which infection might pass from the nasal cavities to the brain was important. Prof. W. E. Le Gros Clark was requested to investigate this problem and made the important discovery that fine material can pass from the nose to the brain in an hour. His report to the committee has just been published by the ministry of health. The problem of the anatomic routes connecting the nasal cavities with the brain had previously been attacked by the somewhat crude method of injecting dyes into the subdural and subarachnoid intracranial spaces of dead animals and human cadavers. The experimenters were able to force the dye through the cribriform plate into the nasal mucosa and thought that it passed by means of lymphatics but did not prove this. In 1914, Weed made classic researches on the circulation of the cerebrospinal fluid by injecting an isotonic solution of potassium ferrocyanide and iron ammonium citrate into the subarachnoid spaces of cats. After death he traced the course of the solution by immersing the tissues in a solution of hydrochloric acid and obtaining a precipitate of prussian blue. He was able to follow the drainage of the cerebrospinal fluid through the arachnoid granulations into the intradural venous sinuses and along the sheaths of the cranial nerves, especially the olfactory. Granules of prussian blue extended down the perineural sheaths into the nasal submucosa and through the endothelial walls of the lymphatic plexus into the vessel lumen. But such injections may rupture delicate tissue and establish artificial communications, and they do not furnish satisfactory evidence of the reverse route, by which material absorbed from the nasal cavity may, under normal conditions, spread from the nasal mucous membrane into the cranium. This question was investigated by Clark. He found that a solution of potassium ferrocyanide and iron ammonium citrate, simply dropped into the nasal cavities of rabbits, reaches the surface of the brain within an hour by way of the perineural sheaths of the olfactory nerves. In the olfactory epithelium prussian blue granules freely intermingled with the cells, many of the nuclei of which were stained. In the respiratory mucous membrane of the nose much smaller quantities of prussian blue were found, indicating that absorption had taken place mainly through the olfactory mucosa. Clark makes the suggestion that the difference may be correlated with special properties of the olfactory mucosa which enables the sensory epithelium to be brought into intimate contact with odoriferous substances of widely different chemical composition.

In this connection the studies of Lowndes Yates on the condition of the accessory sinuses in epidemic encephalitis are of interest. In thirty-four cases he found evidence, both by naked eye and by bacteriologic examination, of nasal infection and of increased power of absorption by the mucosa, which he suggested might be a factor in permitting the entrance of a filter-passing virus. Clark traced the course of the prussian blue granules from the olfactory epithelium along the nerve fibers and then along the nerve sheaths through the cribriform plate up to the olfactory bulb, where they lay in the meshes of the pia-arachnoid. As there was no injection under any artificial pressure, he postulates a current in the perineural spaces running centripetally under normal conditions. He believes that these facts have an important bearing on the question of the passage of infective matter from the nasal cavities to the brain. A case reported by Hayen confirms in man the conclusion drawn from experiments on the rabbit. A man was treated for epistaxis by a pharmacist, who plugged his nose with a tampon soaked in ferric chloride. He died a few days later from meningitis and at the necropsy the olfactory bulbs were found stained brown and gave the prussian blue reaction.

Prohibition of the Marriage of Mental Defectives

The Board of Control (the official body which controls lunacy administration) urges the prohibition of the marriage of mental defectives. In its annual report it says: "It is astonishing that on grounds of so-called morality, well meaning persons are found to countenance and even encourage the marriage of defectives obviously unfitted for the responsibility of parentage. A definite prohibition of the marriage of defectives would prevent socially disastrous unions and make it much easier to secure the protection of young defectives." As to the demand for sterilization of defectives, the board declares that this would not obviate the need for colony or other institutional treatment for large numbers of mental defectives. The majority cannot support themselves, many cannot resist criminal impulses, and others, though not actively dangerous, are a menace to the community, because they have no idea of truth or social obligation and because they cannot keep themselves decently clean. Antisocial habits of this kind are not to be cured or even lessened by sterilization.

Marriage Ban on Women Physicians

What the newspapers call "another hospital sex war" (the previous one was the reverting of the London hospitals to the prewar practice of not accepting women students, which was described in THE JOURNAL) has developed in Birmingham. The difficulty arose at the General Hospital, Birmingham, when a young woman physician applied for reinstatement in her annual appointment and at the same time asked for four months' leave of absence, as she expected a baby. Her request was

granted, but it was also decided by the committee concerned that this would not be done in the future except in exceptional circumstances. The committee advised the board of governors that married women should not be appointed to the hospital and that when women physicians marry they should be asked to resign. This step was taken purely in the interest of the hospital services, so that they should not be interrupted. Prominent women physicians are again up in arms. Lady Florence Barrett, dean of the London School of Medicine for Women, says in a press interview: "There is no reason why married women physicians should be barred from hospital service. Either the character of the individual or the quality of the work done should be the only reasons for dismissal. The private affairs of the individual should not come into the question. Every woman physician who is married does not have children, and marriage should not be a reason for dismissal. It is the private business of the individual."

The Burden of Road Accidents on Physicians

In a letter to the *Times* Dr. Alfred Cox, medical secretary of the British Medical Association, calls attention to the onerous burden on physicians and on hospitals of motor accidents. These patients injured in accidents frequently occupy beds needed for serious cases of illness. The trouble is not so much with the great hospitals in the large centers of population, which are highly organized and have resident officers, but with the large number of small hospitals without resident medical officers, in which the burden of attending accidents falls on the local physicians and is becoming a serious matter to many physicians in country areas. Indeed, it renders the lives of some who live near dangerous points on main roads a nightmare in summer. It is not uncommon for them to be called out three or four times during the week end and to receive not a cent for their services. Indeed, in many instances their attempts to recover fees have been met with silent contempt. The recovery of fees on these occasions is the exception. As a rule physicians are not paid for hospital work, which generally is done for poor people. Not only have the victims of motor accidents caused a very onerous increase in this work, but even when in a position to pay have avoided doing so by taking advantage of the fact that they were treated in a hospital.

PARIS

(From Our Regular Correspondent)

Nov. 13, 1929.

Quack Remedies Officially Denounced

The Comité national de défense contre la tuberculose has recently taken a bold step that has never before been taken in France. By means of posters put up about the city, it has called public attention to a number of quack remedies that are extensively advertised as tuberculosis cures and whose action is recognized as either nil or dangerous. These posters designate by name: the Friedmann vaccine, prepared from the turtle bacillus; Dr. Odin's autovaccine, which provides for reinjection into the patient of his own blood; the Dangerfield method; the Delamazure (Little) method, and the Renner specific. The last mentioned remedy, which is advertised by many journals, and which has given rise to special dispensaries in Paris, takes the form of small pills containing linen paper and a substance resembling the yolk of an egg. The posters of the aforementioned committee frankly inform the public that not one of these so-called specifics ever cured a single case of true tuberculosis, and that, on the contrary, all have caused aggravations and deaths, either directly by their own action, if they have any, or indirectly by causing the patients loss of time in keeping them from trying worth-while remedies. Up to the present time, no seller of these remedies has protested, which is surprising, for the law prohibits the publication of defamatory statements of all kinds before a judge shall have examined them and decided whether or not they are true. No doubt the sellers fear that the publicity of the court evidence might be more unfavorable for them than the posters, which are little read and are soon destroyed, whereas the advertisements of their products continue to appear in the newspapers. The only way to protect the public health against quacks would be to exercise a control over advertisements of medical products such as is found in Germany and in other countries. In France, the government has never thought best to meddle with one of the best resources of the newspapers, nor with the medical products themselves, as they bring considerable sums into the national treasury in the form of duties. Such control is anticipated in the drafted law destined to replace the old act of 1902 pertaining to public health, which every one recognizes as defective; but the revision, although announced from time to time for the past ten years, has been constantly postponed.

Diseases Transmitted by the Water of Swimming Pools

In France, as in other Latin nations, it has always been a difficult matter to habituate the masses to frequent bathing. The installation of public swimming pools in France is of comparatively recent date. The city of Paris has expended large sums in the construction of a number of swimming pools, one of which cost 16,000,000 francs, and was used, four years ago, for the holding of the Olympic games. Two more pools are in process of construction and will soon be completed; they will use the water of two artesian wells, dug in Paris. Outside of Paris, public swimming pools are rare, being found only in the large cities. Just as the hygienists were beginning to rejoice over the movement in favor of greater bodily cleanliness among the working classes, a movement that received considerable encouragement during the war by the regular baths prescribed for soldiers, reports were spread about that tend to check the growth of the movement, in that they inform the people that swimming pools may be the occasion of contracting various contagious diseases. Several physicians had called attention to the danger, and the cry of alarm was taken up by the Academy of Medicine and by the municipal council of Paris. The most recent article on the subject (that of Dr. de La Combe) was presented to the Congress of Otorhinolaryngology, where it created something of a sensation. Dr. de La Combe collected, by his individual efforts, between July 25, 1928, and Oct. 15, 1929, ninety reports of disease contracted in a Paris swimming pool of a populous section of the city (rue Oberkampf) by bathers who had come to consult him. If all the other specialists of Paris have seen as many, the matter would assume a grave aspect. The diseases, in order of frequency, were as follows: twenty-nine cases of suppurative otitis media, eight of which were recurrent and eight with mastoid involvement; fifteen cases of simple or phlegmonous tonsillitis; thirteen cases of rhinitis and sinusitis; twelve cases of pseudomembranous sore throat; eight cases of furuncle of the auditory meatus; five cases of catarrhal otitis; six cases of catarrhal laryngitis, and two cases of diphtheria. While most of the disorders were of a mild nature, a few were somewhat grave, particularly the phlegmonous anginas and the tonsillar abscesses. Among the cases of pseudomembranous angina, there was one that was grave, having been contracted by a young man, aged 19, in the swimming pool at Butte-aux-Cailles, in passing the swimming test for admission to the naval school. He was so gravely affected that he was unable to complete the other tests. As for the two cases of diphtheria, no bacteriologic examination was made; but the clinical symptoms and the rapid recovery following injections of antidiphtheritic serum justify their classification in this category of contagious disorders. These facts are not surprising when one learns (as was admitted at a session of the municipal council) that the scarcity of water, during the unusually hot summer, made it necessary to economize in water to the extent that the swimming pools were cleaned only once a week. It has been decided (as

it should have been long ago) that bathers will not be admitted to the swimming pools until they have taken a shower bath, applying soap to the whole body. But the water from the Seine, which is used in the pools, is itself not very clean, being contaminated by the sewage of small towns of the region traversed before reaching Paris. Several cases of icterohemorrhagic spirochetosis were observed during the past summer in the hospitals in persons who had bathed in the Asnières River. It is evident, therefore, that spring water should be used in swimming pools, which would be difficult in summer when water is scarce. The two new swimming pools mentioned are awakening great expectations, as they will be supplied with water from artesian wells, which is always sterile and which is sufficiently abundant to be constantly renewed.

Reorganization of the Public Charity Services in Paris

The Assistance publique in Paris has an enormous budget, for it not only has to meet the expenses of the hospitals and the asylums but must also provide the funds distributed to the poor and for the support of thousands of children placed in the rural districts. Its expenditures have greatly increased owing to the ever wider application of the social laws, the eight-hour day, leaves of absence, pensions and the constant increases in salary for the personnel. The director, Mr. Mourier, has therefore undertaken a series of reforms calculated to suppress the useless expenditures due to traditional and backward practices. Thus will be brought about a diminution of the most expensive factor—namely, the excessive personnel and the excessive number of functions. Wherever possible machinery will be substituted for human hands. A single bakery has been established to furnish bread for all the hospitals. The daily quantity ranges between 10,000 and 12,000 Kg. This merger results in a saving of 60 per cent in the technical personnel, of 292,000 francs (about $11,500) in salaries and wages, and of 234,000 francs (about $9,000) in fuel, or a total of 526,000 francs (about $21,000). The paymaster's department, which serves the 25,000 men and women employees, instead of being scattered among the several hospitals, is now functioning in a single central office, which likewise tends to reduce the number employed in these services. Whereas there were a hundred employees in this department, with the installation of calculating machines the number has been reduced to twelve. The annual saving amounts to 325,000 francs (about $13,000), which pays in a single year for the cost of the machines. Other reforms have made possible the suppression of many unnecessary positions. Since 1921, in spite of the creation of 4,500 new beds, the administrative personnel has not been increased. In the children's aid service, twenty-five positions, including that of director and clerks, have been suppressed. In spite of the newly created services, there are today 324 fewer workers and 1,100 fewer members of the hospital personnel than in 1920.

Special Sanatoriums for Alcoholic Addicts

A new therapeutic institution for drinkers has just been created at Niederwiller, near Sarrebourg, in the department of Moselle. It is intended for alcoholic addicts of all social classes, who are members of the Catholic church. A Protestant sanatorium for drinkers is located at Niederroëdern in Alsace. The new sanatorium is situated in the midst of a forest, at an altitude of 320 meters, on an estate of 27 hectares, comprising a park, a vegetable garden, meadows and forest; that is to say, under the best climatic and hygienic conditions possible. The restfulness of the scene, the good air, the spacious and comfortable buildings, the good food, the work in the open air, all aid the patient to rid himself of his malady, and to take renewed interest in a well regulated life. The duration of the treatment is six months, on an average. It includes alcoholic detoxification through total abstinence from all fermented beverages and through a substantial diet; the reeducation of the will through the observation of the rules of the institution and of the routine of the day, including conscientious application to the work mapped out for each patient, and the strengthening of the moral consciousness by a well regulated Christian life under well organized family surroundings. Subjects suffering from mental disorders or contagious diseases, together with moral degenerates, are not admitted to the institution. Before he is admitted, a patient must have his attending physician fill out a blank covering his social status. The charges are very modest, ranging between eighty cents and $1.20 a day.

BELGIUM

(From Our Regular Correspondent)

Nov. 19, 1929.

The Medical Specialist

The multiplicity of insurance organizations and of mutual benefit societies that have entered into contracts with the Fédération médicale belge has created a series of obligations and of new circumstances that it behooves the medical profession to study. Likewise, at the twenty-first Congress of Occupational Medicine the question of medical specialists was again brought up, for there is an evident necessity of defining the term "specialist" in order to prevent abuses. Dr. Koettlitz has prepared a list of criteria that are applicable to, and should be applied to, the specialist.

After expressly pointing out that it is not his idea that legal restraint need be resorted to in this field, but that he had in mind only corporative intervention, he made it plain that the rapid growth and extension of specialties and their widespread acceptance by the mutual benefit societies and the general public make necessary a more precise definition of the term "specialist" and the establishment of the conditions on the basis of which the Fédération médicale belge will endorse those who assume the designation.

Dr. Koettlitz proposed as a definition the following: "A specialist is a physician who, if not exclusively, at least in the main, devotes himself to one of the branches, or to a subdivision of one of the branches, of the art of healing, and in which he may have acquired special skill." He reviewed then successively the circumstances and the legal requirements or regulations that, in various foreign countries, determine after a fashion the status of the medical specialist. All the requirements or regulations center about the need of a special course in a hospital service or a polyclinic with special departments. He pointed out also how violations of the legal or professional requirements are punished in various countries.

He emphasized the need in Belgium that the conditions to be fulfilled by those whom the Fédération médicale belge can endorse as specialists be established in some such manner as has been done in foreign countries. This is necessary, now that the Fédération médicale belge is called on (and will be more and more) to enter into collective contracts with mutual benefit societies and various organizations, state-supported or otherwise (social insurance and the like). After the presentation of this paper, the assembly passed the following resolution: "The twenty-first Congress of Occupational Medicine desires the Fédération médicale belge to take note of what has been accomplished in foreign countries and has been recommended by the speaker, with a view to preparing certain regulations pertaining to the title of 'specialist' and that the draft of such regulations be submitted for discussion and consideration at the next general assembly."

Creation of a National Belgian Society for the Combating of Tuberculosis

The crusade against tuberculosis was, until recently, carried on by three principal organizations, one of which grouped together all the centers for the diagnosis of cases and the application of prophylactic measures (dispensaires de la Ligue

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contre la tuberculose); the second brought together the major portion of the therapeutic institutions (sanatoriums et préventoriums de l'Association contre la tuberculose), while the third devoted itself exclusively to the placement in rural or seaside homes of children taken from a contaminated milieu (Oeuvre de préservation de l'enfance contre la tuberculose).

For some time, it has been apparent that a complete merger of the three links forming the ensemble of our antituberculosis armament would constitute an important forward step, not only in the interest of a rapid and complete intervention but also in order to circumscribe, from the point of view of the preservation of the public, the dangers of each focus of tuberculosis.

The creation last year of the Comité national belge de défense contre la tuberculose, which established at the same time regular joint sessions of the administrative personnel of the three societies, was a first step toward their ultimate complete fusion.

This merger, which was earnestly desired by the government, is now an accomplished fact. The constituent societies have been submerged and in their place an organization has arisen that offers a united front against the disease, the new organization bearing the name of the Oeuvre nationale belge de défense contre la tuberculose, which was established with special ceremonies held at the Fondation Universitaire.

The Radiologic Diagnosis of Chronic Appendicitis

De Witte recently gave an interesting account of the value of radiologic researches on appendicitis before the Société belge de radiologie. According to the reports of various authors, the visibility of an inflamed appendix varies greatly. While some speak of 10 per cent of the cases, others report 80 per cent of visibility, or even more. It depends chiefly on the conditions of the examination. By having the patients come at least four times, the author brought up the visibility to 56 per cent of the cases. He found no advantage in giving barium sulphate in buttermilk or otherwise. He found it no better than the administration of magnesium chloride before the examination. Some authors attach great importance to certain direct signs: kinks, lacunae, location at the right of the cecum, retarded evacuation. All these signs must be interpreted with caution, and De Witte cites a series of cases in which, on surgical intervention, the appendix was found sound and intact, whereas the radiologic examination had shown it to be lacunar, kinked, and even located at the right of the cecum. He attaches more importance to retarded evacuation when the sign corresponds with the pain elicited on palpating (a persisting point) the appendix in the various positions of the subject. Moreover, it is not absolutely necessary to seek to see the appendix, the main thing being to establish the existence of painful points and their location in the intestinal tract. The existence of chronic appendicitis from the start was discussed. Frequently, in that case, it is a question of adhesions, kinks, stretching, and the like, of the ascending cecum.

Danzin, in the *Bruxelles médical*, calls attention to a statement of Van de Maele, who found renal calculi in three cases of patients operated on for chronic appendicitis on the basis of a positive McBurney sign. Paquet's remark to those who hold that the radiographic examination in appendicitis is useless is worthy of note. He says that, while it is true that the examination does not often permit the examiner to decide whether or not the appendix is diseased, it shows frequently the existence of lesions in the adjacent area, which may be sufficient to account for the persistence of pains after appendectomy.

Polyps of the Neck of the Bladder

Addressing the Academy of Medicine recently, Dr. De Smeth presented an interesting communication based on cystoscopic examinations applied as a routine measure to women complaining of certain disorders of urination. These examinations have shown how frequently polyps of the neck of the bladder are passed unnoticed. Although the treatises on urology and the special journals refer but rarely to the condition, Dr. De Smeth, since his attention has been called to the point, has collected a number of cases. These polyps are encountered mainly at the time of the physiologic menopause, or they are provoked by a surgical intervention, occurring more particularly after hysterectomy. These lesions, though insignificant in appearance, cause at times painful symptoms, which disappear rapidly under the influence of the treatment recommended by the author.

Polyps of the neck of the bladder appear to be epithelial new growths and not mucous polyps or adenomas. They are located on the neck itself and not in the part of the bladder where the glands described by Cassanello are found.

It is a difficult question to decide whether the cystitis that these polyps induce is due to vascular, vasomotor, endocrine or merely static disorders. The author makes no pronouncement on this point, but he notes a clinical fact that he has often observed —namely, that patients who have undergone hysterectomy are more subject than are others to infection of the bladder and that in such patients examination of the neck of the bladder often reveals irregular epithelial formations of various kinds.

The treatment recommended by the author consists in the instillation of a 4 per cent solution of mild silver protein, or of silver nitrate. In obstinate cases, he has recourse to electrocoagulation with a weak current. This anodyne treatment, which is easy of application, applied in fifteen cases, gave him immediate and encouraging results, but the cases are possibly too recent for one to assume a definitive recovery.

NETHERLANDS

(From Our Regular Correspondent)

Nov. 19, 1929.

Inauguration of the New Neurologic Clinic of the University of Amsterdam

On the occasion of the inauguration of the new neurologic clinic of the University of Amsterdam, Professor Winkler, in a comprehensive address, gave a survey of the development of the teaching of neurology in Amsterdam. Professor Brouwer, in his address that followed, considered the future of neurology and pointed out the various considerations that were influential in the creation of the new clinic. Professor Bouman, in the capacity of director, welcomed the guests and conducted them over the clinic, which has accommodations for 120 patients: sixty men and sixty women. In addition, there are seven private rooms. On the top floor are the laboratories and the rooms for brain dissection. It is interesting to note in passing that a complete study of a brain requires a year and a half of research. On the third floor is the operating room for neurosurgery, and adjoining is the roentgenologic department. This arrangement is very convenient for doing ventriculographies and other examinations requiring the roentgen ray. The new clinic has also a room for the determination of the chronaxia. It is hardly necessary to add that the clinic has modern equipment throughout: a gymnasium, bath establishments, promenades, and the like.

Children in Tuberculous Surroundings

Dr. Heijnsius van den Berg has instituted a comprehensive inquiry to discover the fate of infants brought up in a tuberculous environment. He has made some interesting observations showing that various factors intervene in the fate of children who, during their early years of life, have in their entourage persons with open tuberculosis. When, during the first three months, infants are in contact with a patient affected with open tuberculosis, the effects are much more unfavorable than if the contact takes place between the fourth and twelfth months. All sources of contagion do not represent the same degree of danger. The menace is particularly great a short time before the death of a tuberculous person, and also when

the bacilli in the sputum are especially numerous. A wise and meticulous application of prophylactic measures has a marked influence. When the expectorations of the patient contained few bacilli and careful precautions were taken, 59 per cent of the children observed presented still a negative Pirquet reaction at the end of the second year.

The freedom with which the children were allowed to associate with one another in the lodgings seems not to have exerted any notable effect on their fate. The degree of wealth does not appear to have played an important part.

Breast-fed children showed no more resistance than the others. When suitable prophylactic measures were applied, no breast-fed child of a tuberculous mother died. The prognosis for the exposed or contaminated children depends on the nature and the virulence of the infection.

The results of the inquiry on the fate of young children in an environment in which there is a patient with open tuberculosis reveal the preponderant importance of the nature of the exposure to the contagion. The greater the risk of contagion by a large number of bacilli, the more grave are the consequences for the child. The inquiry did not establish that predisposition plays a rôle at this early age.

Sick Leave for Tuberculous Teachers

The question of tuberculosis among teachers has aroused considerable discussion in recent years. The authorities have adopted the following measures, which the ministries concerned have communicated to the communal administrations and to the school principals, with a view to giving tuberculous teachers the advantages of leaves of absence on account of sickness. Any teacher may submit to the communal administration or to the principal of his school a request for sick leave. Likewise, the communal administration or the principal of a school may, if it is deemed necessary, request the bureau of the inspector of public health to designate a medical specialist in tuberculosis to examine a teacher, though the latter has made no request to the administration. The medical specialist will report to the inspector of public health and will give his conclusions and his proposals concerning the treatment to be followed. The inspector will immediately inform the communal administration or the school principal in regard to the conclusions of the physician, but the medical report remains in the hands of the inspector. In a case of open tuberculosis, the administration or the school principal will request the approval of the ministers to giving the teacher, if need be, a leave of absence. The minister will send this request to the inspector, asking for his advice and counsel. The inspector immediately sends his decision, together with a statement of the conditions that must be met before the teacher can be reinstated.

Examination of Character and Occupational Aptitudes

In "Administrative Arbeid," F. Baumgarten gives a brief account of the methods employed in the examination of character and occupational aptitudes. The problem has been discussed for a long time. Some wish merely to improve the existing methods. Others desire new methods. The latter assert that they can conclude from the manner in which the examinee conducts himself in connection with manual or intellectual work just what his practical accomplishments will be. They watch how he begins his work; whether he does it without asking many explanations; whether he works according to an established plan; whether he takes pleasure in his work; whether he is tidy, and the like.

But one must be cautious about accepting conclusions based on these observations, for a given quality is not always derived from another given quality; for instance, the patience shown by the examinee may be due to his indifference or to his phlegmatic character, as much as or more than to his self-control. It is difficult to form an exact appreciation of character, particularly as regards occupational aptitudes; psychology does not furnish the solution. It can only be said with certain authors that human qualities bear a certain definite relation to one another; for instance, greediness and materialism. In reality, only experience will give exact information.

Professor Koch's Valedictory Address

In taking leave of his associates, Professor Koch delivered, June 22, at the University of Groningen, an address in which he pointed out the many changes that had taken place in medicine during his long career. Thereupon, the rector of the university and the president of the faculty of medicine expressed the thanks of the institution for his instruction. The students gave him a portrait of himself, and others presented him with an album. A member of the student body thanked him in the name of the students.

AUSTRALIA

(From Our Regular Correspondent)

Nov. 1, 1929.

Inquiry into Mental Deficiency in Victoria

Despite the large use now made in modern medicine of mechanical, biochemical and physical aids to diagnosis, it is certain that in estimating normal and abnormal mentalities such aids cannot and should not replace the most attentive study of the individual.

This was the conclusion reached by Prof. R. J. A. Berry, former professor of anatomy at the Melbourne University, in a report on the examination of 1,541 patients of suspected mental abnormality who were admitted to his clinic at the children's hospital at Melbourne.

The report covers the clinical application of the psychometric diagnostic methods evolved by Professor Berry and Mr. S. D. Porteus, who is now professor of pyschology at the University of Hawaii. The application of the methods was made possible by grants from the Edward Wilson Trust.

Many of the lower grades of mental deficiency, he says, can be recognized with ease by the untrained, but many of the higher and much more dangerous aments pass unnoticed by even the medical profession.

Although many estimates have been made of the incidence of amentia, varying from 0.5 per cent to 10 per cent and more, Professor Berry believes that until an anthropometric and mental survey is made of the school population along medical lines the menace of the feebleminded will never be known. His clinic found that 4 per cent of the 820 pupils of a Melbourne state school were mental defectives. If by mental deficiency is understood only obvious idiocy and imbecility, its incidence might be covered by 0.5 per cent. Mental deficiency, however, is much more widespread. It includes all those cases, many of which are unrecognizable under ordinary medical examination, which show a degree of cerebral underdevelopment, the consequences of which, to the individual and to society, often depend on environment. If mental defectives are placed in an unsuitable environment, such as the complexities of modern civilization often demand, it is almost certain that grave consequences will result to the individual and to society. Although he declines, on the data in his possession, to discuss the incidence of mental deficiency in Melbourne, Professor Berry records that of 1,280 patients sent from various institutions and thoroughly examined, 742 were diagnosed as having amentia. Of these 433 were low grade aments of the idiot-imbecile class, and the remainder were classified as high grade aments of a potentially dangerous type.

The children diagnosed as potentially dangerous included one of the only two juvenile fratricides who have been detected in Victoria in ten years. The boy was aged about 14 years, and his inadequate brain growth was not capable of controlling his adult sexual development. The clinic made a prognosis of serious trouble unless the boy could be removed from his home

to a more suitable environment. Despite every effort made by social workers the mother refused to permit the boy to be placed under control because he was at an age when he could earn wages. Three weeks after the final representations were made to her the boy murdered his brother. The other patient was examined by the clinic after the murder, and a diagnosis of mental deficiency was fully established.

Although the Edward Wilson Trust did not consider it right to devote any money to relieve the state of an obligation, at the urgent request of the magistrates Professor Berry was permitted to continue his work at the North Melbourne Children's Court. In 1927-1928, the magistrates referred to the clinic sixty-seven children; 48 per cent were definitely mental defectives and 44 per cent were returned as normal. Of 140 children in charge of the children's welfare department, sixty-eight were found to be aments, forty-five were deferred, and only twenty-seven were found to be normal. Of the sixty-eight aments twenty-eight were high grade types, from whose numbers criminals are recruited.

In 1928 the Edward Wilson Trust appointed a social worker to cooperate with the clinic on lines which had proved successful in the United States. In twelve months the social worker paid 165 visits to 111 patients from the Children's Hospital, the Melbourne Hospital, and the North Melbourne Children's Court. Of the 111 children the worker arranged to have sixteen transferred to different environments. She found that in fifty cases the home environment was eminently unsuitable to mentally defective children, but in most cases the parents had to be told that nothing could be done because there was no institution to which their children could be sent.

Many parents are bewildered by the changed state of mind of their children toward religion, morality, sex, discipline and the like, and they would undoubtedly welcome expert advice. A properly constituted and administered child guidance clinic would provide such expert advice, and it would serve for instruction regarding the establishment of habit, the choice of a suitable vocation, the study of special aptitudes, and related matters. While no known human agency can replace the brain cells denied by nature, and while no known form of therapy can make a mentally defective child normal, much can be done by educational, medical and environmental changes. All these demand a careful individual study of each case, which can be given only by an expert staff with a well equipped clinic.

It is suggested that the scope of the child guidance clinic should be to investigate the phenomena of development in both normal and abnormal children and to supplement these investigations by a training school in the nature of a hospital school for the treatment of all classes of children suffering from mental retardation or physical defects interfering with school progress. The clinic should offer practical work to those engaged in practicing medicine and teaching, and to those interested in social work in the observation and training of normal and retarded children. It should train students for a new profession, that of child study, who would find their career in connection with the school system. The annual cost of the child guidance clinic at the beginning, it is estimated, would be £2,500.

Cancer Campaign in New Zealand

"Just as infantile mortality has been reduced in dramatic fashion by the magnificent work of Sir Truby King and the Plunket Society, even so it is possible, with a cancer campaign, to reduce the sum of sickness, suffering and mortality due to this ever increasing malignant affliction. Without any shadow of doubt a cancer campaign properly organized and financed could do an immense service to the community."

With these words, a circular issued by the New Zealand division of the British Empire Cancer Campaign urges the people of the dominion to cooperate in the movement. The campaign commenced in March, and since then, four subdivisions have been formed in the four main cities.

Dr. Andrew M. Begg, who is to carry out research work at the Otago Medical School, is due to arrive from London early in the new year.

One of the first activities of the Auckland subdivision of the campaign will be to finance the installation of more modern treatment facilities at the Auckland Hospital. An urgent need is a further 600 mg. of radium, which will bring the hospital's supply up to 1 Gm.

Sir Louis Barnett is the chairman of the provisional committee for the Otago and Southland subdivision.

BERLIN

(From Our Regular Correspondent)

Nov. 16, 1929.

Meeting of the Society for Diseases of Metabolism and of the Gastro-Intestinal Tract

The meeting of the Gesellschaft für Verdauungs- und Stoffwechselkrankheiten was held in Berlin, October 16-18. Chairman von Haberer of Düsseldorf emphasized in his opening address that this congress, although it concerned itself with only one field of medicine, yet by its whole makeup, through the cooperation of several medical disciplines, served to bring together what had been separated as the result of the present-day trend toward decentralization.

PHARMACOTHERAPY OF THE DIGESTIVE TRACT

The first main topic, "Pharmacotherapy of the Digestive Tract," was presented by the pharmacologist Professor Trendelenburg of Berlin. In disturbances of the motor functions of the gastro-intestinal tract, the overrapid onward movement of the intestinal contents is due not so much to motor hyperexcitation as to increased excretion of fluid into the intestine as the result of inflammation. Owing to the increased permeability of the damaged cells, the intestinal contents pass through the inflamed intestinal epithelium and have an irritating effect on the intestinal musculature. In diarrheas, the fluid intestinal contents with their toxins come in contact with the rectal mucosa and are absorbed by it, without the liver being able to perform its detoxicating function. The main goal of treatment, therefore, is to eliminate the inflammation of the mucosa, in order to prevent absorption of poisonous substances. Astringent tannins are found serviceable; also the heavy metals, and also adsorbents that bind toxins. On the other hand, intestinal remedies that reduce the motility without combating the inflammation and thus permit an increased absorption of toxins are to be regarded as of little value. In this class may be placed opium and morphine. By means of epinephrine a blocking of the vagus nerve branches to the intestine is possible, but the effect of epinephrine in peroral administration is due doubtless mainly to the local action on the mucosa. In disturbances of gastro-intestinal motility, the behavior of the sphincters is of especial importance. The sphincters are influenced in opposite manners by the autonomic nervous system, as are also the areas that lie between them. What factors release physiologically the important colonic sphincter is, in contradistinction to the pylorus, as yet unknown. Disturbances in the regulatory function of the colonic sphincter are doubtless chiefly responsible for the occurrence of spastic constipation. Atropine will loosen the tension of the sphincters, whereas papaverine, on the whole, checks peristalsis. In atonic constipation, it is important to oppose the inspissation of the intestinal contents. Intestinal motility depends mainly on the degree of intestinal fulness and on the speed with which the filling takes place. Therefore, for the promotion of peristaltic activity the intestine must be filled rapidly. Suitable physiologic remedies are: agar-agar and paraffin to prevent the absorption of fluids; also sodium sulphate or epsom salt, which withdraws fluid from the intestinal wall. Castor oil acts in a similar manner. Rhubarb may cause an inflammatory irritation of the intestinal mucosa. The older

drastic remedies (jalap, colocynth, croton oil) are still worse and may even cause a bloody inflammation. An increased stimulability of the intestinal musculature itself is not attainable by means of choline, owing to the harmful by-effects that appear when an effective dosage is employed. Physostigmine and extract of the posterior lobe of the hypophysis, which acts particularly on the lower ileum and colon, will stimulate it. The Zülzer neohormone cannot be accepted as a genuine hormone. The ethereal oils act probably reflexively by way of the intestinal mucosa, and sulphur through formation of hydrogen sulphide. The physiologic criteria must be paramount in connection with the pharmacotherapeutic interventions.

The paper of Professor Westphal of Hanover took the point of view of the clinician. The alkali therapy applied to acid conditions of the stomach was subjected to sharp criticism and was disapproved. Katsch and Kalk have shown that by the widely used Sippy treatment the hydrochloric acid secretion is, to be sure, checked for the time being, but that it rises all the stronger later. If the dosage is heavy, alkalosis may develop, which causes headache (and other symptoms) usually on the third day. The therapeutic effects of the Sippy treatment are no better than with the same diet without doses of alkali. According to the observations of the speaker, alkali treatment for many years may have a harmful effect; an achylia develops without disappearance of the discomforts and the pain. The process involves a fatigue symptom of the gastric mucosa, for, if the alkali treatment is omitted, the acid secretion reappears after a time. For the elimination of the pain, better results are secured from the administration of a 0.1 per cent solution of hydrogen peroxide than from the alkali treatment. Gastrosuccorrhea is well controlled by lavages with a weak solution of silver nitrate (from 0.1 to 1 per cent), which furthers the development of granulations and acts as an astringent. In increased motility and in gastric ulcer, atropine alone in heavy doses (1 mg. three times a day, later 0.5 mg.) is particularly recommended. The abolition of the antrum spasm and the pylorospasm, in spite of the reduction of peristalsis, leads to more rapid evacuation of the stomach. The general disturbances produced by the high dosage of atropine are at first actually beneficial. Papaverine, even in heavy doses, cannot compete with atropine in overcoming spasm. Morphine and its derivatives are strongly contraindicated, as they only cause more pylorospasm and more spasm of the antrum. In gastric achylia the administration of hydrochloric acid, as the symptoms indicate, remains the chief mode of treatment. In hypotonia of the gastric musculature, strychnine in heavy doses has been found more effective than pilocarpine. Disturbances of intestinal motility are to be treated in the same manner as those of the stomach.

TREATMENT OF PYLOROSPASM

The second topic on the program, "The Treatment of Pylorospasm," was presented by Professor Eckstein, pediatrician of Düsseldorf. The three factors of pyloric stenosis are: (1) hypertrophy of the pyloric musculature; (2) recurrent spasms, and (3) hyperexcitability of the vomiting center. Pylorospasm is a congenital disorder that has an ontogenic basis. The vomiting in association with pyloric stenosis is of purely cerebral origin, for it can be warded off for weeks by suitable hypnotics that produce a sort of continuous sleep without disappearance of the pyloric tumor or the gastric rigidity. That fact can be utilized therapeutically; likewise, the reflex arc can be interrupted by remedies that act on the parasympathetic system. In the treatment of pyloric stenosis, with the improvements in the operative technic, changes have come about, even in the methods of the pediatricians. Recent statistics show much better results in cases treated by operation than with the more conservative methods. This is shown most clearly by a comparison from the same clinic. At the Düsseldorf pediatric clinic, the mortality in a series of eighty-five cases in which internal treatment was employed was 20 per cent; in a series of thirty-four cases with operative treatment, 5.9 per cent. In these thirty-four cases, some of which were very severe, there was only one fatality that occurred as the direct result of the operation (hemorrhage). If the operation is postponed too long, the duration of the healing process is thereby lengthened. It is important that, with operative treatment, the average duration of the stay in the hospital is only thirty-six days, or, counting from the day of the operation, only twenty-nine days; with internal treatment it is eighty-one days. The difference in time lost is a social indication in favor of operation. In addition, the worry occasioned friends and relatives is less. After-treatment must remain in the hands of the pediatrician, as the infants suffer more or less from nutritional disturbances. Three hours after the operation, small quantities of mother's milk are given as the first form of food. At the same time, any greater loss of body fluid is prevented by rectal injection of fluids by the drop method. Heart remedies should be avoided as far as possible, since in these children who are in a fasting condition there is a certain tendency to spasms as a result of complicating operative acidosis. The Schlossman clinic, which for many years past has favored internal treatment of pylorospasm, can no longer refuse to recognize the good results of operative treatment and regards operation, if the external conditions permit, as the preferable treatment. In connection with his paper, Eckstein displayed a film showing an operation performed by von Haberer after the Weber-Ramstedt method.

Professor Kirschner of Tübingen discussed the subject from the standpoint of the surgeon. On the one hand, when internal treatment is employed, a number of children with pylorospasm succumb, whereas the prospects with a timely operative intervention are excellent. It is evident, therefore, that an operation should be resorted to if the internal treatment does not give prompt results. The preferable technic is that of Weber-Ramstedt, without modifications; that is to say, the simple division of the pyloric sphincter with the sharp edge of the knife, under direct observation. The chief precondition of success is exact technic, and precision and speed of execution. It is an imperative necessity that all constricting muscle fibers shall be divided without injury to the mucous membrane (danger of perforation). If the operative technic is correct, the children can be regarded as cured within a few minutes after completion of the operation. Dietetic after-treatment by the pediatrician is needed. The harmlessness of the operation is shown by the fact that the speaker, in a series of forty-four cases, during the past ten years, had only one fatality, that of a patient who died as the result of otitis media.

(To be continued)

Marriages

REIDAR TRYGSTAD, Brightwaters, N. Y., to DR. ETHEL ELIZABETH HIRSCH of Brooklyn, November 2.

CLAYTON FINDEIS HOGEBOOM to Miss Genevieve Merriam Borgers, both of Chicago, December 17.

NATHANIEL SCHWARTZ, Portland, Maine, to Miss Rose S. Shelling of Brooklyn, November 9.

EDWARD FRANK KOHRS to Miss Florence Marie McConnell, both of New York, November 19.

VICTOR WESLEY LOGAN, New York, to Miss Martha Skinner of Holyoke, Mass., October 20.

EDWARD M. IRWIN to Miss Emma Guenther, both of Belleville, Ill., in November.

FRED H. STIRES to Miss Mary Martha Hughes, both of Akron, Ohio, recently.

HARRY HUDSON to Mrs. Bertha Rearick, both of Philadelphia, December 12.

LESTER N. BATES to Miss Pauline Jennings, both of Fremont, Ohio, November 28.

CHARLES A. NEAL, Nicholasville, Ky., to Miss Narcissa Tyler, November 27.

Deaths

Harold Gifford ⊕ emeritus professor of ophthalmology, University of Nebraska College of Medicine, Omaha, died suddenly, November 28, of acute endocarditis, aged 71. Dr. Gifford was born in Milwaukee, Oct. 18, 1858. He graduated from Cornell University in 1879, in 1882 graduated in medicine at the University of Michigan Medical School, where in 1912 he was granted an honorary M.A. degree. The University of Nebraska awarded Dr. Gifford an LL.D. in 1918. He was professor of ophthalmology at the University of Nebraska from 1903-1925; was chairman of the Section on Ophthalmology, 1897-1898, and a member of the House of Delegates of the American Medical Association in 1909; past president of the Nebraska State Medical Association; a member of the American Academy of Ophthalmology and Oto-Laryngology and the American College of Surgeons. He was for many years ophthalmic and aural surgeon to the Methodist Hospital in Omaha. Dr. Gifford not only contributed numerous articles on eye and ear diseases to current medical literature but was a leader in civic affairs in his community.

HAROLD GIFFORD, M.D., 1858-1929

Edward R. Askew, Hugo, Okla.; College of Physicians and Surgeons, Dallas, Texas, 1905; member of the Oklahoma State Medical Association; aged 50; died in November at the U. S. Veterans' Hospital, Muskogee, of cardiorenal disease.

Della Hannah Williams, Berwyn, Pa.; Woman's Medical College of Pennsylvania, Philadelphia, 1909; for many years on the staff of the West Philadelphia Hospital for Women; aged 53; died, November 1, of angina pectoris.

Charles A. Forgey, Columbia, Tenn.; Medical Department, University of Tennessee, Nashville, 1890; member of the Tennessee State Medical Association; aged 67; died, November 13, of an injury received in a fall.

Howard Isaac Heavilin, Cadiz, Ohio; Ohio State University College of Medicine, Columbus, 1910; member of the Ohio State Medical Association; aged 49; died, November 12, of cerebral hemorrhage.

Rudolph O. Born ⊕ New York; Medical Department of Columbia College, New York, 1877; formerly on the staff of the New York Polyclinic Hospital; aged 76; died, November 17, of pneumonia.

William Henry Martland, Irvington, N. J.; University of Michigan Medical School, Ann Arbor, 1873; Civil War veteran; aged 84; died, November 12, of cerebral hemorrhage and arteriosclerosis.

Irvin J. Heckman, Poplar Grove, Ill.; College of Physicians and Surgeons, Chicago, 1895; aged 68; died, October 28, at the Hinsdale (Ill.) Sanitarium, of strangulated postoperative ventral hernia.

Frank Lee Cessna, Louisville, Ky.; Kentucky School of Medicine, Louisville, 1891; aged 65; died, November 17, at the Kentucky Baptist Hospital, of aortic insufficiency and bronchopneumonia.

Marvin Cappel, Alexandria, La.; University of Louisville (Ky.) School of Medicine, 1911; member of the Louisiana State Medical Society; aged 40; was shot and killed, November 9.

Floyd Ellsworth Best ⊕ Wells, Minn.; Northwestern University Medical School, Chicago, 1911; served during the World War; aged 41; died, November 9, of acute leukemia.

Preston Cornelius, Berea, Ky.; University of Louisville School of Medicine, 1892; member of the Kentucky State Medical Association; aged 67; died, November 1, of influenza.

James G. Allison, Ford City, Pa.; Baltimore Medical College, 1895; member of the Medical Society of the State of Pennsylvania; aged 61; died, October 2, of cardiorenal disease.

Harry Bowman Felty, Abilene, Kan.; Jefferson Medical College of Philadelphia, 1892; member of the Kansas Medical Society; aged 60; died in April, of a self-inflicted bullet wound.

Harry S. Durrett, Ellis, Kan.; Louisville (Ky.) Medical College, 1879; aged 77; died, August 13, at St. Anthony's Hospital, Hays, of carcinoma of the pancreas.

Peter Monakey, Tupper Lake, N. Y.; University of Montreal Faculty of Medicine, Montreal, Que., Canada, 1885; aged 72; died, November 7, of heart disease.

Charles P. Brenn ⊕ Western, Neb.; American College of Medicine and Surgery, Chicago 1906; aged 46; died, November 8, of a self-inflicted bullet wound.

Martyn Taylor ⊕ Sciotoville, Ohio; Medical College of Ohio, Cincinnati, 1896; aged 60; died, October 22, at the Mercy Hospital, Portsmouth, of pneumonia.

Robertum Edward Holbrook, Brandon, Man., Canada; McGill University Faculty of Medicine, Montreal, 1907; aged 49; died, September 11, of myocarditis.

John D. Hamilton, Louisville, Ky.; Hospital College of Medicine, Louisville, 1885; aged 71; died, November 14, at the City Hospital, of heart disease.

Clarence Warwick Heffenger, Sykesville, Md.; University of Maryland School of Medicine, Baltimore, 1881; aged 68; died, June 17, of enterocolitis.

Richard M. H. Berndt ⊕ San Francisco; Medical Department of the University of California, 1893; aged 73; died, November 16, of heart disease.

Thomas Elmer K. Dihel, Chicago; University of Louisville (Ky.) School of Medicine, 1893; aged 67; died, November 23, of chronic myocarditis.

Alford B. Phillips, Glenrock, Wyo.; Homeopathic Hospital College, Cleveland, 1883; aged 67; died, September 15, at Daphne, Ala., of tuberculosis.

John W. Faust, Searcy, Ark.; Hospital College of Medicine, Louisville, 1898; aged 55; died, November 14, of poison, presumably self-administered.

John Homer Hoffman, Baltimore; University of Maryland School of Medicine, Baltimore, 1881; aged 72; died, August 2, of carcinoma of the bladder.

Cornelius L. Clancy, Chicago; Rush Medical College, Chicago, 1883; aged 76; died, November 19, of cerebral thrombosis and embolism.

Frank Swan Wade ⊕ New Richmond, Wis.; Hahnemann Medical College and Hospital, Chicago, 1883; aged 69; died, October 3, of heart disease.

Earnest A. Denson, Harleston, Miss.; Memphis (Tenn.) Hospital Medical College, 1898; aged 65; died, October 2, of cerebral hemorrhage.

William A. Thornhill ⊕ Charleston, W. Va.; Medical College of Virginia, Richmond, 1901; aged 49; died, November 14, of angina pectoris.

Frederick Tuckerman, Amherst, Mass.; Harvard University Medical School, Boston, 1882; aged 72; died, November 8, of heart disease.

Eugene Wilson, Mount Hope, Ohio; Ohio Medical University, Columbus, 1906; aged 62; died suddenly, in November, of heart disease.

Frank Kerr, Proctorville, Ohio; Barnes Medical College, St. Louis, 1894; aged 71; died, September 23, at Wichita, Kan., of heart disease.

Thomas Edward Macauley, Pasadena, Calif.; Detroit College of Medicine and Surgery, 1891; aged 65; died, November 3, of heart disease.

George C. Vincent, Deckerville, Mich.; Detroit Homeopathic Medical College, 1875; aged 86; died, October 21, of arteriosclerosis.

Robert Walter Smith, Donovan, Texas; Memphis (Tenn.) Hospital Medical College, 1902; aged 64; died in October of heart disease.

Charles Elias Travers, Relay, Md.; Maryland Medical College, Baltimore, 1910; aged 47; died, July 28, of myocarditis and nephritis.

Everett A. McCosh, Detroit; Detroit College of Medicine and Surgery, 1896; aged 57; died, February 8, of cerebral hemorrhage.

George W. Robinson, Trinidad, Colo.; Chicago Medical College, 1879; aged 79; died, September 17, of nephritis.

Bureau of Investigation

COLLUM'S DROPSY REMEDY

For some years the Collum Dropsy Remedy Company of Atlanta, Ga., has been selling, on the mail-order plan, an alleged cure for dropsy. The remedy consists of three boxes of large pills, or boluses, and five bottles of liquid preparation. The pills, or boluses, are known as "Remedy No. 1"; then there are two bottles of "Remedy No. 5," two bottles of "Remedy No. 6," and one bottle of "Remedy No. 7."

The boluses, or Remedy No. 1, are said "to relieve the short breathing" and "remove the water"; Remedy No. 5 is said to "purify the blood and strengthen the entire system"; Remedy No. 6 is "for the stomach and digestion," while Remedy No. 7 "will relieve the cough that accompanies dropsy in a few days."

Some of the claims made for the nostrum—claims that the company is careful not to make on the trade package, which would be subject to the national Food and Drugs Act—are:

"Our Remedy relieves short breathing in a few hours, removes the water and swelling in a few days."

"Removes Uric Acid and regulates the Liver, Kidneys and Bowels."

"Removes all Poisonous Fluids and corrects Stomach, Digestion and Heart."

"Purifies the Blood, and strengthens up the entire system, leaving the system in a strong and healthy condition and in this way it prevents the swelling from returning."

"Effects A Cure in curable cases in from 60 to 90 days, if directions are followed."

"We Cure Dropsy and all of its attendant ills."

The Collum preparations are advertised by the free-sample method: "Dropsy treated one week free. Short breathing relieved in 36 to 48 hours; swelling reduced in 15 to 20 days."

Those who answer the advertisements are sent some of the boluses, or pills, which are supposed to be the chief part of the treatment. The first of the follow-up letters states: "We guarantee this medicine to cure any case that is curable." Accompanying it is the usual symptom blank, together with a booklet containing testimonials and recipes for remedies for "blind staggers," colic in horses and chicken cholera.

The instructions that come with the pills are that at six o'clock in the evening one large pill is to be taken in water, followed at twelve o'clock the same night by one of the small pills. Next morning at six o'clock the victim is to take one large tablespoonful of epsom salt, another tablespoonful at seven

DROPSY
Treated One Week Free!
DROPSY TREATED ONE WEEK FREE
Short breathing relieved in 36 to 48 hours; swelling reduced in 15 to 20 days. Regulates the heart, corrects the liver and kidneys. Purifies the entire system. Collum Dropsy Remedy Company, Dept. 168, Atlanta, Ga.
DROPSY TREATED ONE WEEK FREE
DROPSY TREATED ONE WEEK FREE
DROPSY TREATED ONE WEEK FREE

o'clock and still another at eight o'clock. The instructions are that the pills are to be taken every other night and followed up with salts.

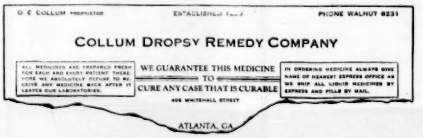
A complete original package of the Collum Dropsy Remedy, consisting of the pills, or boluses (No. 1), and the five bottles of liquid medicine (Nos. 5, 6 and 7) was submitted to the A. M. A. Chemical Laboratory for analysis. The Laboratory report follows:

LABORATORY REPORT

"*Medicine No. 1.*—This consisted of large pills averaging in weight 3.1 Gm. (approximately 48 grains) and small pills, averaging in weight 1.6 Gm. (approximately 24 grains). An accompanying leaflet contained directions for taking, a diet list and statement of prohibited foods and beverages. No statement as to the contents of the pills was found on the trade package or the accompanying circular.

"Microscopic examination indicated the presence of a substance resembling a 'Catechu' phlobaphen—i. e., an insoluble material resulting from the oxidation of tannin-like bodies; wheat starch, a trace of vegetable tissue, and an extract appearing to be licorice, the latter predominating. Qualitative tests indicated the presence of traces of ammonia, calcium, potassium, and sodium; chlorides and sulphates; a volatile oil suggestive of anise. Heavy metals, organic acids, such as acetates, citrates and tartrates, phosphates and alkaloids were not found. The ash on ignition was 2.6 per cent. The water-insoluble material was found to be 29.6 per cent.

"*Medicine No. 5.*—This consisted of 505 cc. (approximately 17 fluid ounces) of a light, red colored liquid, possessing an aromatic odor suggestive of orange, containing floating particles (dirt); the reaction of the mixture to litmus was distinctly acid. The specific gravity was found to be 1.0533 at 20 C. The label admitted the presence of 2 per cent of alcohol.



"Qualitative tests indicated the presence of iron, iodides, an organic substance readily reducing Fehling's solution, suggestive of sugar (dextrose), a trace of sulphates and a red coloring material. Arsenic, phosphates and alkaloids were not found. The total solids amounted to 14.3 per cent, consisting essentially of a relatively large amount of a thick, red, syrupy mass.

"From the results of the tests, it appears that Collum Dropsy Remedy Number 5 is essentially a syrup of ferrous iodide, to which has been added a red coloring material.

"*Medicine No. 6.*—This consisted of 515 cc. (approximately 17.5 fluid ounces) of a deep red-colored liquid, possessing an aromatic odor suggestive of wild cherry, with floating particles (dirt). The liquid was acid to litmus and its specific gravity was 1.060 at 20 C. The label declared the presence of alcohol, 12 per cent.

"Qualitative tests indicated the presence of ammonia, an organic substance readily reducing Fehling's solution, suggestive of sugar (dextrose), hypophosphites, traces of calcium, potassium and sodium, and red coloring material. Heavy metals, such as iron, manganese and arsenic, were not found. The total solids were found to be 23.4 per cent, consisting essentially of a large amount of a thick, deep red syrup.

"From the results of the tests, it was concluded that the Collum Dropsy Remedy Number 6 is essentially a syrup of ammonium hypophosphite, to which has been added red coloring material.

"*Medicine No. 7.*—This consisted of 234 cc. (approximately 8 fluid ounces) of a thick, straw-colored, syrupy liquid, possessing a sweet, followed by a cooling saline taste, and having floating particles (dirt). It gave an acid reaction to litmus; its specific gravity was 1.2380 at 20 C. The label admitted the presence of 4 per cent of alcohol.

"Qualitative tests indicated the presence of ammonia, an organic substance readily reducing Fehling's solution, suggestive of sugar (dextrose), and chlorides. Heavy metals, organic acids, glycerin and alkaloidal substances were not found. The total solids were found to be 63 per cent, consisting essentially of a thick, golden-yellow syrup.

"From the foregoing tests, it appears that the Collum Dropsy Remedy Number 7 is essentially simple syrup, to which ammonium chloride (muriate of ammonia) has been added."

In addition to the chemical analyses just described, it seemed desirable to check the Laboratory's chemical findings on the pills, or boluses, with some pharmacologic work. Several of the pills (Medicine No. 1) were, therefore, sent to Dr. Hugh McGuigan, Professor of Pharmacology at the University of Illinois College of Medicine, for pharmacologic examination. Dr. McGuigan, assisted by Dr. W. J. R. Camp, performed a number of experiments, which will be described in detail elsewhere, and from these, Dr. McGuigan reached the following conclusion:

> "These boluses do not contain enough of any substance (such as digitalis) which either increases the force of contraction of the heart, raises blood pressure, or acts as a diuretic. Consequently, since it neither improves circulation nor acts as a diuretic, it seems quite improbable that it could be of any value in conditions like dropsy."

It is evident from the chemical and pharmacologic experiments that the claim that the pills, or boluses, sold by the Collum Dropsy Remedy Company will cure dropsy is wholly without justification. The boluses were found to consist essentially of a phlobaphen—that is, of anhydrides of tannin—to which had been added extract of licorice, the flavoring agent resembling oil of anise, and minute traces of inorganic salts. Remedy No. 5, sold under the claim that it will purify the blood and strengthen the entire system, was evidently a colored syrup of ferrous iodide. Remedy No. 6, sold "for the stomach and digestion," was found to be a colored syrup of ammonium hypophosphite, while Remedy No. 7, which the manufacturer declares will "relieve the cough that accompanies dropsy in a few days," was simply syrup to which had been added muriate of ammonia.

From the foregoing, it is obvious that whatever results are obtained in the reduction of the dropsical condition are due not to the Collum preparation but to the heavy and repeated doses of epsom salt, or other salines, that the victim is instructed to take at hourly intervals following the ingestion of the Collum boluses!

As to the business itself: Dropsy, being a symptom and not a disease and usually the result of incompetent heart or kidney action, is quite evidently not a condition that should be self-treated. The sale of remedies for the alleged treatment of dropsy is, in our opinion, without justification either in economics or morality.

Correspondence

CAJAL'S AND HUBER'S VIEWS ON NERVE REGENERATION

To the Editor:—In the review of Cajal's, "Degeneration and Regeneration of the Nervous System" (THE JOURNAL, November 30, p. 1757) it is stated that the work of Cajal did much to overthrow the polygenistic conception of nerve regeneration, which had been upheld by a number of investigators, among whom the reviewer includes Dr. G. C. Huber. Cajal quotes the work of Howell and Huber (*J. Physiol.* **13**) in which they refer to the bands of Bünger as "embryonic fibers" which, they said, were capable of conductivity. However, on page 377, they say, "We have said that in our examinations of the peripheral end when not united with the central end, we found no newly formed myeline or axis." Again, on page 386 they speak of "the outgrowth of new axes from the old axes of the intact fibers of the central end." Cajal seems to be completely ignorant of Huber's work in 1895 (*J. Morph.* **11**) in which he sets forth clearly the principles of the monogenistic doctrine long before Cajal entered this field of investigation. To include Huber among those believing in the polygenistic doctrine is to be compared to placing Pasteur among those who discredit the germ theory of disease. The work of Huber on peripheral nerve repair during the World War is well known to American medicine. It seems an injustice for the work of a man who has done so much in the study of degeneration and regeneration of nerves to be misquoted and improperly evaluated in Cajal's book.

JOSEPH C. HINSEY, Chicago.

TRANSILLUMINATION OF BREASTS

To the Editor:—In THE JOURNAL, November 23, Dr. L. Clarence Cohn of Dr. Bloodgood's clinic reported two examples in which solid tumors of the breast transilluminated as clearly as simple cysts. One tumor proved to be an intracanalicular myoma and the other a small colloid carcinoma. Dr. Cohn states that transillumination had been used in more than a hundred cases and that these were the only two instances in which solid tumors transilluminated clearly.

I am grateful to Dr. Cohn for recording these observations. When I first tested the value of transillumination I encountered similar examples in which small solid tumors were apparently translucent. On further investigation I learned that this discrepancy occurred when the tumor was small and especially when its situation in the breast was such that the light was in close proximity to it. Under these conditions a small tumor in a thin breast is overilluminated by the strong light and a false translucence is established.

In my original communication on this subject (*Surg. Gynec. Obst.* **48**:217 [June] 1929) I pointed out this source of fallacy as follows:

> In this connection it is important to stress one possible source of error. Small solid tumors situated near the surface of the breast often give the false impression of being translucent. This is due to the diffusion of light around the tumor caused by the intense light closely applied to the small mass. The proximity of the lamp to the tumor is the main factor. On closer examination a faint shadow can usually be made out. Under these conditions it is important to interpret the faintest shadow as positive for a solid mass. A similar optical illusion is reproduced when the light is applied directly against the palmar surface of the phalanges. The bones of the fingers appear to be translucent for the same reasons which have been pointed out. This error may be avoided by reducing the intensity of the light by means of the rheostat and by placing the lamp at a greater distance from the tumor.

Transillumination is of value in the differential diagnosis of lesions in the breast in three ways:

1. In distinguishing between solid tumors and cysts filled with clear fluid.
2. In differentiating between traumatic hematoma and carcinoma, and
3. In localizing the underlying lesion in cases of bleeding nipple in which a tumor cannot be felt on clinical examination.

MAX CUTLER, M.D.,
New York City Cancer Institute,
New York.

TREATMENT OF FRACTURE OF MALAR BONE WITH DISLOCATION INTO MAXILLARY SINUS

To the Editor:—During the football season of 1928 I was called on to treat a high school boy with a fracture of the malar bone with dislocation into the maxillary sinus. The picture of the defect was classic. As I had never seen one before, I did not know how to treat it. I consulted all the books available but was not satisfied with the methods given. Any cutting or hooking externally would leave a scar on the face. Chiseling into the antrum through an incision lateral to the alveolar processes had its attendant danger of injury to misplaced dental roots.

Under general anesthesia I entered the antrum with a Wiener rasp through the medial bony wall beneath the inferior turbinate at the usual thin point. I then inserted a medium-sized solid urethral sound. With a little manipulation I was able to engage the end of the sound under the dislocated fragment and to press it back into its normal position. The textbook after-care was followed, and practically no deformity remained.

Of course the antrum could be entered under local butyn anesthesia, but a general anesthetic is probably better for relaxation of the muscles. This method might not achieve such good results in all similar cases, but on account of its simplicity and freedom from resulting scars I think it should be the method first attempted.

Singularly enough, about a month later I was consulted by a young man on account of his eye protruding when he blew his nose. This phenomenon appeared immediately after a fall face first, though I did not see the patient until the next day. There was a fracture of the malar bone and floor of the orbit in this case, but not enough displacement to warrant operative procedure. The air was entering the orbit from the antrum and possibly also from the ethmoids.

J. J. HORTON, M.D., San Angelo, Texas.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

TERMINATION OF GESTATION BECAUSE OF TUBERCULOSIS

To the Editor:—A married nullipara, aged 21, missed a menstrual period four weeks after marriage and is presumably pregnant (having been always regular with the menstrual function prior to marriage). I have just discovered that she has rather advanced pulmonary tuberculosis and an interruption of pregnancy seems necessary here. What is the most approved and safest method of terminating gestation in the first four to six weeks? Would it not be best to do it now rather than to wait for further signs of pregnancy in a case of this kind? Please use initials only.

M.D., Ohio.

ANSWER.—If the patient has advanced pulmonary tuberculosis it is generally considered advisable to terminate the pregnancy without delay. The best method of emptying a uterus which contains a four to six weeks' gestation is slow dilation of the cervical canal with Hegar dilators and curettement of the uterus with a moderately sharp curet. Inhalation anesthesia is contraindicated. A general anesthetic is not necessary because the operation can easily be performed under local anesthesia after administration of morphine and scopolamine. A few centimeters of procaine hydrochloride injected into each broad ligament just lateral to the cervix will suffice to make the operation painless and will permit easily dilation of the cervical canal. The needle through which the procaine is being injected should be kept in constant motion to avoid injecting the solution into a blood vessel. If a physician who has produced an abortion in Ohio is charged with having committed criminal abortion, he can justify what he has done only by showing (1) that the abortion was in fact necessary to preserve the life of the mother or (2) that two physicians believed and advised, before the abortion was produced, that the abortion was necessary to save the life of the mother. Unless a physician is satisfied that he can produce such evidence if called on to do so, he would do well to refrain from the operation.

COD LIVER OIL AND IODINE DURING PREGNANCY

To the Editor:—1. There is a growing tendency to advise the use of cod liver oil during pregnancy, in order to provide an abundance of calcium to meet the demands of the growing fetus. In the light of our present knowledge, is such procedure a safe one? Is there danger of such administration causing unusual hardness of the bones in the fetal head so as to prevent molding and consequent dystocia? 2. A number of writers have advocated the use of iodine during pregnancy in order to prevent subsequent goiter in the child later in life. In what amount and with what frequency should these medicines be given? Please omit name.

M.D., California.

ANSWER.—1. Cod liver oil can be recommended with safety to the mother throughout her pregnancy.

2. Almost any form of iodine may be given, including special preparations and iodized salt. The iodized salt must be used throughout the greater part of pregnancy because, if it is employed only during the last trimester, it is of little value in the prevention of congenital goiter. The intake of iodide in the form of iodized salt permits a person to obtain 10 mg. of iodine each week, as advocated by Marine. Iodized salt contains 0.02 per cent of iodine, and the yearly intake of iodine is approximately between 300 and 700 mg. This is far in excess of the theoretical normal adult requirement.

INTRADERMAL TEST FOR SCARLET FEVER

To the Editor:—How reliable (what percentage) is the intradermal test in determining proof of diagnosis of scarlet fever when performed within ten days of disappearance of the rash? In other words, how much can I depend on the intradermal test performed on a scarlet fever patient about ten days after the fading of the rash in order to establish the fact that the patient did not have scarlet fever? Can the incorrectness or correctness of diagnosis of scarlet fever alone be determined and be depended on by any intracutaneous or intradermal serum or antitoxin tests performed on patients after the rash has faded? Please omit name and address.

M.D., Iowa.

ANSWER.—The intradermal test with scarlet fever toxin is intended for determining susceptibility to scarlet fever rather than for the diagnosis of scarlet fever in patients already sick.

However, under certain circumstances, the intradermal test with scarlet fever toxin may be helpful in the diagnosis of scarlet fever. If at the onset of the disease the test is made and found to be positive and later in the disease the test is repeated and found to be negative, the change from susceptibility to immunity as indicated by the change from a positive to a negative skin test during the course of the illness indicates that the illness was scarlet fever.

The negative skin test during convalescence without an earlier skin test with which to compare it would indicate only that, at some time before the skin test was made, the patient had acquired immunity to scarlet fever. It does not necessarily mean that this immunity was acquired during the illness under consideration. It might have been acquired earlier.

Intradermal blanching tests with scarlet fever antitoxin can be used for the diagnosis only when the rash is still present.

The incorrectness or correctness of diagnosis of scarlet fever cannot be accurately determined by any intradermal test made ten days after the rash has faded unless, as stated, the skin test with scarlet fever toxin was positive before the attack or early in the attack and negative later.

TREATMENT OF AMENORRHEA AFTER CURETTEMENT

To the Editor:—What kind of tissue replaces the endometrium after curettement of the uterus? Is it possible for scar tissue to form and thus completely prevent menstruation? A married woman, aged 42, gives a history of having had three curettements, abortions at six weeks to two months. Previous to abortions health and menstruation were good, but after the curettements the menstrual flow, gradually over a period of years, grew less and less and finally stopped in March, 1929. There was also much premenstrual distress and a feeling of great prostration during the scant flow. She is not pregnant. There are no other signs of a possible early menopause. Is it possible for scar tissue to replace the normal endometrium to such an extent that menstruation is unable to take place or is the destroyed lining membrane of the uterus always replaced by normal endometrium after deep curettage? Endocrine preparations have not been helpful. What treatment would you suggest? Her health at present is below par, which she attributes to the fact that menstruation has been absent about seven months. Please omit name.

M.D., Seattle.

ANSWER.—After ordinary curettement the endometrium regenerates from its basal zone, the outer (proliferative or functional) zone only being removed by the instrument. However, curettement might remove the entire mucosa, especially if too thoroughly done, as was rather frequently the case in the '80s and '90s, last century. Then scar tissue only could take the place of the endometrium and there could be no further menstruation. This might easily be the case after repeated, vigorous curettements, close together and following the termination of pregnancy.

In the case cited, however, the patient being 42 years of age, menopause could not be regarded as precocious, perhaps only somewhat early. Menstruation will probably not recur and the only treatment is that aimed at the climacteric itself.

POSSIBLE SEQUELAE OF TOXIN-ANTITOXIN INJECTIONS

To the Editor:—A boy, aged 12 years, received 1 cc. of Squibb's toxin-antitoxin, the first dose being given, October 18. His parents tell me that his arm felt stiff immediately after the injection. He said that he did not feel well the following week, and on October 25 he developed a typical case of acute inflammatory rheumatism. When seen, October 26, he had a mitral murmur and a dilated heart. I believe this heart lesion is an old condition that has not arisen in the course of the present illness. His tonsils were removed five years ago. His older brother had a bad attack of inflammatory rheumatism with a resulting heart lesion about a year ago. His mother has had two attacks of inflammatory rheumatism and is said to have a bad heart, though I have never examined her. As further matters of interest, the boy's grandmother has a chronic valvular heart lesion and two little cousins have congenital heart lesions. Is it possible for the injection of toxin-antitoxin to cause inflammatory rheumatism or to light up a latent infection of this kind? The parents believe that the present trouble comes from the inoculation. Is there any danger, so far as known, in giving toxin-antitoxin to all children from 6 months to 12 years of age? Which is safer and more effective, toxin-antitoxin as usually given in three doses or Mulford's "toxoid" given in two doses? Is the latter generally recognized by state boards of health and other health authorities?

B. A. HIGGINS, M.D., Sylvan Grove, Kan.

ANSWER.—There is no reason why a person should not develop rheumatism about the time diphtheria toxin-antitoxin is given as well as at any other time. The many thousands of injections of diphtheria toxin-antitoxin with no similar appearance of acute rheumatism argue against any connection between the two in the case related.

It is proper to give diphtheria toxin-antitoxin to well children between 6 months and 12 years of age. Any who are Schick negative do not need it. The diphtheria "toxoid" has not been used generally in this country. It has, however, been used extensively in Canada and Europe with reported satisfactory results. As it does not contain foreign serum, it does not produce any sensitiveness to later injections of horse serum.

POTASSIUM PERMANGANATE IN PNEUMONIA—VINCENT'S ANGINA

To the Editor:—1. I am interested in the use of potassium permanganate in the treatment of lobar pneumonia and bronchopneumonia. I use one-half grain of potassium permanganate in 6 ounces of tap water as a retention enema. This amount is given four times during twenty-four hours. When necessary, it is preceded by a cleansing enema. I believe that it aids in the treatment. Can you give me any information as to this, especially as to its physiologic action and dangers, if any, when used this way? 2. What do you advise in the treatment of Vincent's angina? Kindly omit name.

M.D., North Dakota.

ANSWER.—1. It was the fact that potassium permanganate destroys the poison of snake bite that induced H. W. Nott (1925, 1926), the originator of this treatment, to try it in pneumonia. But, as is well known, the permanganate is of value only when it can come in contact with the poison locally. It is worthless after the poison has been absorbed into the system: for potassium permanganate cannot enter the circulation without having its oxidizing power destroyed at the point of entry. Hence, any benefit obtained from the permanganate in pneumonia is certainly not due to antidotal effect on the toxin. Nor can it be due to absorption of oxygen which is not liberated as such; and, if it were, it would be merely in insignificant quantities. While the mode of action of this treatment, if it has any value, is not understood, one may formulate theories to explain whatever clinical effects might be noted. Thus, in the first place, the patient might be benefited by the introduction of additional fluid into the system. Secondly, the obvious irritation of the intestinal mucosa produced by the permanganate—as is evidenced by the liability to pass mucous casts of the bowel in the stool—might suggest that the absorption of the cell destruction products may possibly produce a nonspecific protein effect.

2. The organisms of Vincent's angina are perhaps best antagonized by means of oxidizing agents such as solution of hydrogen peroxide (diluted with an equal amount of water), potassium permanganate (1:5,000), or sodium perborate. The latter may be used in 2 per cent solution as a mouth wash and gargle as well as in the form of a thick paste applied, preferably by the physician, to the ulcers and retained there for four or five minutes while the oxidizing froth develops. The mouth should then be rinsed with warm water. Cauterization with 10 per cent chromic acid, 50 per cent trichloracetic acid or strong silver nitrate solution may be employed for resistant areas. The application of powdered arsphenamine to the affected area is of help.

COMPOSITION OF STER-TABS

To the Editor:—What is the composition of Ster-Tabs, recommended to be added to water in which instruments are to be sterilized?

C. J. A., M.D., Chicago.

ANSWER.—Inquiry was made by the A. M. A. Chemical Laboratory of the J. Sklar Manufacturing Company concerning the composition of their product. In due time, the following was received:

We have just received the formula from the National Drug Co. of Philadelphia who are making these tablets for us.

The formula is as follows:

Sodium carbonate (Monohydrated).....	18 grs.
Sodium nitrite	7½ grs. in each tablet

TREATMENT OF DEFORMITIES OF THE SPINE

To the Editor:—Will you kindly inform me how long a plaster-of-paris cast is to be worn in a fracture of the tenth vertebra and chipping off of the eleventh of two small fragments? Compression of the spinal cord or injury to the spinal canal did not occur. Can there be a complete recovery? What company and author publishes a book on treatment of the spine? Please omit name.

M.D., Colorado.

ANSWER.—For this type of injury the patient is usually kept flat in bed in a Bradford frame or a plaster bed from six to ten weeks. After that he is allowed to become ambulatory and wears either a plaster corset or some other type of spinal brace prohibiting flexion of the spine. If there are no symptoms of cord pressure, the recovery may be complete except for a slight stiffness in the region of the fracture. The length of time the back brace should be worn varies with the age of the individual and the amount of compression of the vertebra involved; usually a year is sufficient.

Any first class textbook on fractures will give instruction with regard to the treatment of such a case. One special book written by Dr. Arthur Steindler is entitled "Diseases and Deformities of the Spine and Thorax," published by the C. V. Mosby Company, St. Louis.

USE OF GOLD BUTTON PESSARY

To the Editor:—Is the use of the gold button pessary efficacious in preventing conception? Is it likely to produce infections? If a pregnancy occurs with its use does it then act to produce abortion? Is its use considered honest? If you publish this kindly omit name and address.

M.D., New York.

ANSWER.—The gold button pessary is not always successful in preventing conception. Furthermore, this type of pessary not infrequently is the cause of a severe cervical and uterine infection and it is highly probable that in most instances the sterility which follows the insertion of a gold button pessary is due to the associated infection. Some of these infections are difficult to cure. Occasionally there results not only an infection but also a vesicocervical fistula. If a pregnancy supervenes, abortion may result or the pregnancy may go to term. In one instance such a pessary was found embedded in a full term placenta. These pessaries have occasionally been found in the uterine cavity long after the patients have believed the pessaries had been lost or removed by a physician. Most physicians consider the use of these pessaries unnecessary and dangerous.

TRAUMATIC CATARACT

To the Editor:—Can you tell me the shortest possible time a traumatic cataract can develop after injury? This is not a lawsuit but to satisfy the referee in a state compensation case and prevent an injustice to a poor laboring man.

A. L. COYLE, M.D., New Martinsville, W. Va.

ANSWER.—The shortest time possible that a traumatic cataract can develop after injury depends entirely on the character of the injury and the extent of the injury to the anterior capsule of the lens. If that capsule has been opened wide by the injury, opacity of the lens may develop within twenty-four hours to such an extent that the fundus can no longer be seen. It would take somewhat longer for all of the lens fibers to become permeated by the aqueous and thus become completely opaque. If the trauma has been a blunt one without perforating injury, the lens opacity may develop slowly and not become manifest for several weeks.

PATHOLOGY OF CORONARY EMBOLISM

To the Editor:—Please describe the gross and microscopic pathologic changes of the heart muscle along with the involved vessel or vessels in coronary occlusion resulting in death. What vessel or vessels are usually involved in coronary embolism and why? What changes in the nerves occur in coronary embolism? Is the electrocardiogram the only absolute method of discovering the relative size of the chambers of the heart? Does it give any additional data other than the electrical muscular potential? Please omit name.

M.D., Connecticut.

ANSWER.—When death is caused by obstruction of one of the coronary arteries, or of one of their large branches, the disease is commonly coronary thrombosis. A clot of blood gradually forms where the artery wall is diseased, fills the channel there, and barricades the passage so that propulsion of blood beyond that point is no longer possible. Sometimes death occurs so soon that it is the only clinical manifestation. When it fails to take place quickly, other symptoms appear lasting for hours or days or until recovery.

The coronary arteries may become obstructed in other ways, so uncommon that many writers fail to mention them. One of these is coronary embolism, as a rule, a sequence or complication of thrombo-ulcerative endocarditis. The embolus, a fragment of the masses of clotted blood on one of the aortic cusps, is carried along in some portion of the coronary arterial vessels until its size matches that of the channel and the lumen is plugged. Another form of obstruction is closure of the mouth of either of the main arteries by portions of the aortic valves loosened by endocarditis, acting as flaps and swept by the current of blood against these orifices in the aortic wall. Syphilis of the aorta, so predominant at the aortic root, also brings about closure of these openings.

The effect on the heart muscle of loss of its supply of arterial blood by any of these more or less violent obstructions varies widely according to the time elapsing between the occlusion of the artery and death, the size of the obstructed artery, the amount of anastomosis between subdivisions of the two arteries, the degree of narrowing by sclerosis where the current still flows, and the amount of collateral circulation which already may have been established by way of the thebesian veins (Wearn, J. T.: The Rôle of the Thebesian Vessels in the Circulation in the Heart, *J. Exper. Med.* **47**:293 [Feb.] 1928).

Sometimes, although rarely, when death is immediate there are almost no gross or microscopic changes, or they may be solely regions of hemorrhage so minute that they are found only with the microscope. But with life persisting as it frequently does for at least some hours or even days, the anemic necrosis with bordering zones of exudation and hemorrhage

characteristic of infarction are found, sometimes with hemopericardium from rupture of the heart wall, sometimes with dissection of the softened necrotic places in the muscle due to blood being forced by systolic contractions into the infarct from the cavity of one of the ventricles. Scars result when the infarcts heal, and when the scars are large the wall there may bulge outward forming chronic parietal aneurysms of the heart; regeneration of the muscle does not take place to any appreciable extent.

The obstruction with coronary thrombosis is most commonly at the descending branch of the left or anterior artery about an inch distal to the aorta. Why this place is so favored is not known, nor is there any understanding of the changes in the nervous apparatus of the heart with infarction. There is no doubt that competent roentgenologists are able to detect enlargement of the heart with the fluoroscope as well as in roentgenograms. There are good reasons for believing that electrocardiograms may reveal what portions of the myocardium are injured by infarction (see p. xiv under "Science News" in *Science*, June 21).

SODIUM CITRATE AS COAGULANT

To the Editor:—I wish to request your discussion of the enclosed article concerning the use of sodium citrate for arresting hemorrhage.

"SODIUM CITRATE FOR ARRESTING HEMORRHAGE

"Continued use has shown that the intravenous injection of a strong solution of sodium citrate affords the most prompt and certain means of arresting hemorrhage from any cause and in any site. It may be systematically used to arrest tubercular haemoptysis at any stage of the malady. It is equally useful in controlling surgical hemorrhage, and that from mucous ulcerated surfaces or from infected wounds and inaccessible cavities. In gynaecology it is valuable in flooding hemorrhage from fibroma and menorrhagia. Bleeding haemorrhoids are remarkably susceptible to citrate treatment. The best results are obtained when combined with magnesium chloride in the following injection: sodium citrate, 30; magnesium chloride, 10; water, 100. From 15 to 30 cc. of this, according to the weight of the patient, is slowly introduced into a vein in the bend of the elbow. The higher dose may be exceeded without danger."—Renaud, M.: *L'Union pharm.*

I have been taught and used sodium citrate to prevent coagulation of the blood. Reference to several authorities, one of which is the Epitome of the U. S. Pharmacopeia and National Formulary, indicates that sodium citrate prevents coagulation and in no place have I been able to find a notation that it induces coagulation. Evidently my request shows my ignorance of the pharmacology involved, as the article appears to be a good one. However, if I may use sodium citrate on patients with hemophilia, I should like to be aware of this fact.

R. A. IRONS, M.D., Thomasville, Ala.

ANSWER.—The introduction of this hypertonic solution would increase the coagulability of the blood by its osmotic action causing damage to the cellular elements, most especially perhaps the blood platelets, with liberation of fibrin ferment. In other words, this would be a nonspecific salt effect, observable with any other harmless saline. The addition of the magnesium chloride will increase the effect by acting the same way. The total concentration of citrate secured by even the largest dose recommended is below the level required for lessening the coagulability of the blood by inactivation of the calcium.

CHOLESTEROL FOR ALOPECIA—USE OF CARBON ARC

To the Editor:—1. Will you kindly outline the treatment of alopecia with cholesterol. 2. Is the Leibel-Flarsheim high intensity arc lamp a satisfactory therapeutic lamp according to the Bureau of Standards or the American Medical Association Council's ruling? Please omit name.

M.D., Pennsylvania.

ANSWER.—1. The use of cholesterol in the treatment of alopecia grew out of Jaffe's work done in 1926. Since then three articles on the subject have appeared in the literature (Habermann, R.: *Deutsche med. Wchnschr.* **54**:1560 [Sept. 14] 1928. Krichel: *Ibid.* **55**:275 [Feb. 15] 1929. Joseph, W.: *Med. Klinik* **24**:343 [March 2] 1928). These authors used a cholesterol preparation manufactured by Promonta of Hamburg. This is painted on the denuded areas and, it is said, causes hair to grow. The reports are no more definite than that. Apparently English and American literature does not contain any reference to the subject.

2. According to information at hand, the carbon arc lamp manufactured by the Leibel-Flarsheim Company is an efficient source of ultraviolet rays. By proper design many of the objectionable features heretofore associated with the carbon arc have been obviated. It is practically noiseless and odorless. The current consumed in the arc is about 25 amperes, while the current drawn from the line does not exceed 15 amperes even when the arc is struck. However, the lamp can be operated only on alternating current, since the device employs a transformer. A lamp of this power consumption and equipped with cored carbons that emit strongly in the biologically active ultraviolet zone can be used satisfactorily in the treatment of conditions amenable to this form of therapy.

Medical Education, Registration and Hospital Service

COMING EXAMINATIONS

COLORADO: Denver, Jan. 7, 1930. Sec., Dr. W. W. Williams, 224 State Capitol Bldg., Denver, Colo.

DISTRICT OF COLUMBIA: Washington, Jan. 13, 1930. Health Officer, Dr. W. C. Fowler, District Bldg., Washington, D. C.

NATIONAL BOARD: Feb. 12-14, 1930. In all centers where there are five or more candidates. Dir., Mr. E. S. Elwood, 225 South Fifteenth St., Philadelphia, Pa.

NEW YORK: New York City, Albany, Syracuse, Buffalo, Jan. 27-30, 1930. Chief, Mr. H. J. Hamilton, Educational Bldg., Albany, N. Y.

NORTH DAKOTA: Grand Forks, Jan. 7-10, 1930. Sec., Dr. G. M. Williamson, Grand Forks, N. D.

OREGON: Portland, Jan. 7-9, 1930. Sec., Dr. Joseph F. Wood, 510 Selling Bldg., Portland, Ore.

PENNSYLVANIA: Philadelphia, Jan. 7-11, 1930. Bedside examination last two days in various Philadelphia hospitals. Dir., Mr. D. C. Koch, Harrisburg, Pa.

SOUTH DAKOTA: Huron, Jan. 21-22, 1930. Dir., Dr. H. R. Kenaston, Bonesteel, S. D.

WASHINGTON: Seattle, Jan. 9-10, 1930. Basic Science. Dir., Mr. Charles Maybury, Olympia, Wash.

WISCONSIN: Madison, Jan. 14-16, 1930. General Sec., Dr. Robert E. Flynn, 315 State Bank Bldg., La Crosse, Wis.

Virginia June Examination

Dr. J. W. Preston, secretary of the State Board of Medical Examiners of the State of Virginia, reports the written examination held at Richmond, June 18-21, 1929. The report covered 8 subjects and included 80 questions. An average of 75 per cent was required to pass. One hundred and thirteen candidates were examined, of whom 110 passed and 3 failed. Fourteen physicians were licensed through reciprocity with other states and 5 by endorsement of credentials. The following colleges were represented:

PASSED	Year Grad.	Per Cent
Howard University School of Medicine	(1927)	76, 77, 79
Washington University School of Medicine	(1927)	86
University of Pennsylvania School of Medicine	(1927)	89
Meharry Medical College	(1928)	75, (1929) 81
Medical College of Virginia	(1929)	76, 76, 76, 77, 78, 78, 78, 78, 78, 78, 78, 79, 79, 79, 79, 79, 79, 80, 80, 80, 80, 81, 81, 81, 82, 82, 82, 82, 82, 82, 82, 83, 83, 83, 83, 83, 83, 83, 83, 83, 84, 84, 84, 84, 84, 84, 84, 84, 84, 85, 85, 85, 85, 85, 85, 85, 85, 86, 86, 86, 86, 87, 87, 88, 88, 89, 89, 90, 91
University of Virginia Department of Medicine	(1929)	84, 84, 85, 85, 86, 86, 86, 86, 86, 86, 86, 86, 87, 87, 87, 87, 87, 88, 88, 89, 89, 89, 89, 89, 89, 89, 90, 90, 90, 90, 92
Osteopaths		79

FAILED	Year Grad.	Per Cent
Medical College of Virginia	(1929)	70, 72
Meharry Medical College	(1928)	68

LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
George Washington University Medical School	(1926)	Dist. Colum.
Howard University School of Medicine	(1928)	Dist. Colum.
Emory University School of Medicine	(1927)	W. Virginia
Bennett Medical College	(1914)	W. Virginia
Hospital College of Medicine, Louisville	(1897)	Mississippi
University of Maryland School of Medicine	(1927)	Maryland
University and Bellevue Hospital Medical College	(1922)	New York
University of Pennsylvania School of Medicine	(1926)	N. Carolina
Temple University School of Medicine	(1915)	Maryland
Meharry Medical College	(1918)	W. Virginia, (1924) N. Carolina
University of Tennessee College of Medicine	(1927)	Tennessee
Vanderbilt University School of Medicine	(1927)	Tennessee
Medical College of Virginia	(1928)	N. Carolina

ENDORSEMENT OF CREDENTIALS	Year Grad.	Endorsement with
Johns Hopkins University School of Medicine	(1926)	N. B. M. Ex.
Harvard University Medical School	(1926)	N. B. M. Ex.
Washington University Medical School	(1926)	N. B. M. Ex.
Vanderbilt University School of Medicine	(1928)	U.S.P.H.S.
Medical College of Virginia	(1918)	U. S. Navy

New Mexico April Endorsement Report

Dr. William T. Joyner, secretary of the Board of Medical Examiners of the State of New Mexico, reports 10 candidates licensed by endorsement of credentials at Santa Fe, April 8-9, 1929. The following colleges were represented:

ENDORSEMENT OF CREDENTIALS	Year Grad.	Endorsement with
University of Georgia Medical Department	(1925)	Georgia
Rush Medical School	(1892)*	Colorado
University of Louisville School of Medicine	(1894)	Texas
University of Michigan Medical School	(1924)	Michigan

Central Medical College of St. Joseph	(1903)	Colorado
University of Cincinnati College of Medicine	(1921)	Ohio
Medical College of the State of South Carolina	(1926)	S. Carolina
Memphis Hospital Medical College	(1910)	Oklahoma
University of Texas School of Medicine	(1926)	Texas
University of Virginia Department of Medicine	(1898)	Tennessee

* License granted subject to filing a completed endorsement.

Book Notices

ENDOCRINE DISORDERS. By Professor Hans Curschmann, Director of the Medical Clinic, University of Rostock i. M. With an introduction by Franz Prange, Doctor of Medicine and Philosophy. Cloth. Price, $4. Pp. 188, with 46 illustrations. New York: Oxford University Press, 1929.

Only the surface of the field of endocrinology has been scratched. Many conditions, such as hyperthyroidism and hypothyroidism, tetany and spasmophilia, acromegaly, the Froelich syndrome and Addison's disease, are recognized as clinical entities. These subjects are described clearly and concisely by one who has had considerable experience with diseases of the ductless glands and who gives first hand information. The author does not believe that iodine should be used in exophthalmic goiter by the general practitioner except in a hospital. Foods rich in tryptophan should be allowed in myxedematous conditions and be withheld in the hyperthyroses, a term he proposes for the varieties of hyperthyroidism. He calls attention to the rôle of occupation and season in the cause of some forms of tetany. The Erb sign is the most important pathognomonic sign of tetany, and this and the Chvostek sign are necessary for such a diagnosis. The drugs recommended for its cure are calcium, calcium chloride urea, fresh parathyroid and Collip's serum. Curschmann believes that infantile tetany can pass into true epilepsy. Nothing new is presented in the description of the other well known diseases of the endocrines. The author covers much ground in the discussion of the varieties of pituitary diseases and of the differential diagnosis of the varieties of obesities, gigantism and dwarfism. This, of course, brings in the relation of the gonads. Some features of gonadal disturbance as inversion, homosexuality and hermaphroditism are described by Dr. F. Prange. Whether these are real endocrine disturbances is yet to be settled. Still other varieties are still more indefinite. This is not necessarily the fault of the author but is undoubtedly due to the lack of knowledge. For example, this author attempts to establish the clinical entity of a pluriglandular deficiency based on a primitive dysplastic or hypoplastic condition of the endocrines and does not succeed in convincing the reader of his success. As he himself states, not all are agreed as to which of these indefinite pictures represent an endocrine disease and which not. That an interrelationship between the thyroid and the suprarenal, or the suprarenal and the pancreas and between other endocrine glands does exist has been more or less fully established. It is too early, however, to be dogmatic in this sphere. The reader must look on and wait patiently with the hope that this mass of indefinitely known material will be unscrambled in the near future. The book is well arranged and well illustrated.

MATERNAL MORTALITY: REPORT ON MATERNAL MORTALITY IN ABERDEEN, 1918-1927, WITH SPECIAL REFERENCE TO PUERPERAL SEPSIS. By J. Parlane Kinloch, M.D., J. Smith, M.D., D.Sc., and J. A. Stephen, M.A., M.B. Paper. Price, 1s. net. Pp. 60. Edinburgh: His Majesty's Stationery Office, 1929.

In 1917, Matthew Hay instituted in Aberdeen a special system of inquiry into the deaths of women occurring during pregnancy and within four weeks after delivery. The present report contains data of 252 maternal deaths that occurred during the ten years from 1918 through 1927. It is divided into two parts, the first being a critical analysis of the data collected and the second dealing with the bacteriology of puerperal sepsis. The investigators did not find any relationship between environmental conditions and puerperal mortality. The influence on maternal mortality of illegitimacy, age, occupation, health before and during pregnancy, syphilis and parity was the same as is generally believed to exist. It was found that the death rate for each thousand maternity cases was 2.8 in the practice of midwives, 6.9 in the practice of physicians and 14.9 in institutional practice. The opinion is advanced that the higher incidence of puerperal sepsis in the practice of physicians as contrasted with midwives is due to contagion, which is dependent in considerable part on a streptococcal carrier condition in physicians. The most important causative organism in puerperal sepsis is the hemolytic streptococcus, and the same type of streptococcus may produce puerperal fever, scarlet fever, erysipelas and pyogenic infections. The investigators believe that, if the risk of contagion in maternity hospitals is to be restricted, the number of patients and their spacing in the wards must be rigorously controlled. The report is interesting and instructive and demonstrates how much valuable information can be obtained by conscientious public health officers. The Scottish Board of Health deserves the greatest commendation for having made such a painstaking study.

METHODS AND PROBLEMS OF MEDICAL EDUCATION. (Fourteenth Series.) Paper. Pp. 207, with illustrations. New York: Rockefeller Foundation, 1929.

This series consists of three articles. The first, by Drs. Charles L. Scudder and Nathaniel Allison, deals with the complete record of a case of fracture as recorded by the fracture service of the Massachusetts General Hospital, Boston, and is fully illustrated with charts, case records, data sheets, laboratory notes, x-ray sheets and roentgenograms. In the second report, the Department of Public Health and Preventive Medicine of the Peiping (Peking) Union Medical College, Peiping (Peking), China, is fully described by Dr. John B. Grant, professor and head of the department. There are illustrations showing the floor plans and interiors of the public health station and the various activities. The appendix contains a form for reporting on public health activities in a city, followed by a tentative appraisal form for China, with record sheets used to diagnose community needs and to prescribe the essential steps to remove causes of excess mortality and morbidity. The third article, by Drs. Benjamin Hoyer and A. Graeme Mitchell, deals with the record system of the Children's Hospital, Cincinnati, showing the record forms in use in the hospital. From these elaborate and detailed reports, hospitals can obtain valuable suggestions for their own record systems.

ELEKTROTHERAPIE: EIN LEHRBUCH. Von Dr. Josef Kowarschik, Primararzt und Vorstand des Institutes für physikalische Therapie im Krankenhaus der Stadt Wien. Third edition. Paper. Price, 22.60 marks. Pp. 312, with 274 illustrations. Berlin: Julius Springer, 1929.

In the first part of the book the electronic theory of electricity, the structure of the atom and the derivation of units are discussed with diagrammatic clarity. This offers an enlightening introduction to the field of electricity. The section devoted to the discussion of apparatus has a more limited value, since American instruments differ considerably from those used in Europe. Nevertheless, many excellent ideas may be gleaned from the hook-ups and the construction methods presented. Ingenious electrodes, devised by the author, represent in many cases an improvement over methods employed here and render possible more efficient application to various parts of the body. The author deals specifically with galvanism, faradism, the method of Bergonié, the sinusoidal current, high frequency currents and static electricity. In each instance the path of current, the size of the electrodes and the exact dosages within therapeutic ranges are given. An additional portion of the book is devoted to the physiologic rationale of the various agencies, in many cases supported by protocols of animal experimentation. The portion of the book pertaining to therapy is of great value, presenting not only the indications but also the contraindications and the electrical diagnosis. Occupational therapy, muscle education, maladies of the peripheral nervous system and similar subjects are adequately discussed, with especial reference in all cases to treatment. This is a superior textbook and should be accessible to every one interested in this type of work.

NEW VIEWS OF EVOLUTION. By George Perrigo Conger, Ph.D., Associate Professor of Philosophy, University of Minnesota. Cloth. Price, $2.50. Pp. 235. New York: Macmillan Company, 1929.

The public interest in evolution arising from the warfare between the fundamentalists and the scientists has given rise to a number of works attempting to elucidate the subject for the general reader. Professor Conger not only considers evolution from the point of view of the scientist but also traces evolution in the thoughts, actions and motives of men. He

analyzes all of the phases of evolution in life and comes to the conclusion that the animal body and the human brain have reached their limit and that the future evolution will be largely along social lines. The world goes on and the philosophers tell us that we must go on with it.

THE SCIENCE OF PSYCHOLOGY: An Introductory Study. By Raymond Holder Wheeler. Cloth. Price, $3.75. Pp. 556, with 68 illustrations. New York: Thomas Y. Crowell Company, 1929.

This volume is prepared as an introductory study particularly for college students. It brings into the picture all of the current conceptions and theories. It does not follow the old anatomic basis, concluding with the relationships of thought process and anatomy and physiology rather than beginning with such a foundation. Wisely the author ends his work by calling attention to the fact that theories in psychology come and go rapidly and that the student need not feel that theories acquired today will still be useful even tomorrow.

DIAGNOSTIK UND THERAPIE DER KINDERKRANKHEITEN MIT SPEZIELLEN ARZNEIVERORDNUNGEN FÜR DAS KINDESALTER. Ein Wegweiser für den praktischen Arzt. Von Prof. Dr. F. Lust, Direktor des Kinderkrankenhauses (Bad. Landesanstalt für Säuglings- und Kleinkinderfürsorge) in Karlsruhe. Sixth edition. Paper. Price, 10.50 marks. Pp. 536. Berlin: Urban & Schwarzenberg, 1929.

This edition has followed within one and one-half years the fifth edition. Just as in previous editions, it was necessary to make numerous additions and revisions in several chapters in keeping with the progress of pediatric therapeutics during the past year. In order not to increase the size of the book to any extent, much out-of-date material was omitted. The author through his experience and practice has attempted to maintain the practical usefulness of the book. Translations of it are appearing in English, Italian, Spanish and Russian. This is essentially a practical book for the pediatrician and especially a guide for the general practitioner doing some pediatrics. Although the title indicates a book on diagnosis and treatment, the emphasis is predominantly on treatment. There is almost nothing on etiology. The diagnosis and differential diagnosis are mostly in outline or compend form. Only the high points are touched on. However, more attention is given to the diagnosis of strictly pediatric conditions than those occuring also in the adult. There are no illustrations.

A TEXT-BOOK OF ANATOMY AND PHYSIOLOGY. By Jesse Feiring Williams, M.D., Professor Physical Education, Teachers College, Columbia University. Third edition. Cloth. Price, $2.75 net. Pp. 578, with 405 illustrations. Philadelphia: W. B. Saunders Company, 1929.

The last edition of this work appeared a few years ago. The present volume has been thoroughly revised. It includes a vast mass of material addressed essentially to the college student rather than to the general reader. The book is not intended for medical students but for the well educated person who wishes to have accurate knowledge concerning the human body and its functions.

NOTES ON CHRONIC OTORRHŒA WITH ESPECIAL REFERENCE TO THE USE OF ZINC IONIZATION IN THE TREATMENT OF SELECTED CASES. By A. R. Friel, M.A., M.D., F.R.C.S.I., an Assistant Aurist, School Medical Service, London County Council. Cloth. Price, $2.25. Pp. 88, with 54 illustrations. New York: William Wood & Company, 1929.

In England especially, the use of zinc ionization has in recent years been practiced to a considerable extent. In this little book the author gives an outline of the physics and chemistry of electrolysis and ionization. Then the apparatus for zinc ionization of the ear is described. A short chapter on the anatomy of the ear, the causes of chronic infections and the sphere of zinc ionization follows. The author in speaking of infections of the ear employs the word "sepsis" to "indicate infection of the discharge as distinct from the infection of the living tissues." Even when there are only small perforations of the drum membranes, the author believes that the use of zinc ionization is indicated. He believes that almost all chronic suppurations of the ear are amenable to this method of treatment, provided that complicating factors such as polyps, cholesteatoma, and caries are first eliminated so far as possible. In looking over the tabulations of the results obtained by the ionization, one is struck by the high percentage of the reported cures. If it is possible to duplicate these efforts elsewhere, surely a great advance has been made in the treatment of chronic suppuration. But, judging from the experience of most physicians in this country, either the proper technic is not employed or the character of cases is such that the excellent results cited by the author cannot be duplicated. This little monograph will prove of interest to any one who is interested in this method of treatment and will probably stimulate others in the endeavor to cure these annoying, obstinate and often distressing cases of otorrhea.

THE BUREAU OF PROHIBITION: ITS HISTORY, ACTIVITIES AND ORGANIZATION. By Laurence F. Schmeckebier. Institute for Government Research, Service Monographs of the United States Government, No. 57. Cloth. Price, $2. Pp. 333. Washington, D. C.: The Brookings Institution, 1929.

This document provides the reader with a history of the development of Volsteadism, a record of the activities of enforcement officers, an outline of the organization of the bureau, and all of the laws and modifications of laws that enter into the picture. For the general reader the facts of most importance are found under the heading "Activities." This is in every sense of the word a document and not an argument, but it affords excellent material for those who would engage in debate.

KER'S INFECTIOUS DISEASES. A Practical Textbook. Revised by Claude Rundle, O.B.E., M.D., M.R.C.S., Medical Superintendent, City Hospitals and Sanatorium, Fazakerly, Liverpool. Third edition. Cloth. Price, $10.50. Pp. 614, with illustrations. New York: Oxford University Press, 1929.

The infectious diseases continue to take their toll of lives, but in the last decade there has been some progress made in finding curative and prophylactic measures efficacious for several of them. In this standard and well written textbook on the infectious diseases, the author has taken a sane and thoughtful attitude toward these innovations in the prophylaxis of measles, diphtheria and scarlet fever. Unfortunately, this revision of the book occurred before the more recent unfavorable reports of the Tunnicliff goat serum were published, so that in the book only the favorable results are mentioned. The introductory chapter presents some general facts concerning bacteriology, infection, anaphylaxis and fever. The concluding chapter discusses some of the problems of the contagious disease hospital. The conditions discussed, other than the contagious diseases of childhood, are typhus fever, typhoid, cerebrospinal fever and erysipelas. The material is clearly and completely presented. Those who require a knowledge of the infectious diseases cannot afford to be without this volume. It should prove invaluable to the pediatrician, the physician engaged in general practice, and the student.

SURGICAL DISEASES OF CHILDREN. A Modern Treatise on Pediatric Surgery. Two volumes. By Samuel Walter Kelley, M.D., LL.D., F.A.C.S., Member Senior Staff, St. Luke's Hospital, Cleveland, Ohio. Third edition. Cloth. Price, $15. Pp. 1374, with 615 illustrations. St. Louis: C. V. Mosby Company, 1929.

The pediatrician, although a specialist, finds himself much in the same position as the physician engaged in general practice. He is the general practitioner for children. As such he finds it necessary to have a thorough working knowledge of the specialties, including surgery. These two volumes concerning the surgical diseases of children present the special phases of the subject so clearly and concisely that obtaining the working knowledge of surgery is a fairly easy task for those who peruse their pages. Theoretical and practical surgery are woven together in admirable fashion, and all essential details are given without excess verbiage. In the present edition much material has been rewritten and more than three hundred illustrations have been added, which even further increase the value of the book. All branches of surgery receive consideration. There are chapters dealing with surgical conditions due to congenital malformations, deficiency diseases, paralyses and new growths. The first two chapters entail discussions of examination and case taking and the general surgical pathology of the developing period. Infections, fractures, dislocations and orthopedic conditions are given thorough consideration. One chapter is devoted to tuberculosis of the bones and joints. The author points out that the book is in no sense meant as an encyclopedia, but so well has the field been covered that it can serve in this manner.

Medicolegal

Negligence and the Doctrine of Res Ipsa Loquitur

(Brown v. Shortlidge (Calif.), 277 P. 134)

The defendant was employed to perform what the court refers to as "a minor surgical operation" on a 6 year old child; that is, to remove the tonsils and adenoids. According to the record, at the time set for the operation the defendant was delayed in his arrival at the hospital and came in evidently in haste, and the operation was rushed along in a hurried manner. After the patient was relaxed, under the influence of a general anesthetic, the defendant placed a gag in the patient's mouth and adjusted it. He then busied himself fixing the light and other paraphernalia necessary for the operation. A minute or two later, he saw blood on the patient's lips. An examination showed one of the upper central incisor teeth lying loose in the mouth and showed a fracture of the superior maxillary bone. Suit was brought because of the loss of the tooth. Judgment was rendered in favor of the plaintiff, and the defendant appealed, contending that the doctrine of res ipsa loquitur did not apply and that it was necessary for the plaintiff to prove affirmatively some positive act of negligence by the defendant.

"If a patient should visit a surgeon for the purpose of having a mole removed from the right foot," said the court, "and awoke from an anesthetic minus his left arm, it is certain that some satisfactory explanation would be required to stop the fact itself from broadly proclaiming the negligence of the surgeon. The difference between such a case and the case at bar is one of degree only. If the surgeon in the case at bar could stand upon some imaginary rule of law to the effect that when one submits himself to surgical treatment he may expect anything to happen, so likewise could the surgeon in the supposed case." In support of its finding, the court of appeal quoted from *Vergeldt* v. *Hartzell* (C. C. A.) 1 F. (2d) 635, which itself had quoted from *Evans* v. *Roberts*, 172 Iowa 653, 154 N. W. 923:

> This is not the ordinary case where a practitioner is sought to be charged with liability for alleged improper treatment of some bodily ailment or infirmity. He was employed to remove the adenoids from the plaintiff's throat, and there is neither claim nor proof that he did not successfully remove them. His negligence, if any, was in failing to take due care to avoid injury to the undiseased parts in the vicinity of which the operation was performed; and while it may be true that, had the operation upon the adenoids been unsuccessful and disappointing, no inference of negligence or want of skill would arise therefrom, it does not follow that this rule applies with the same force to an injury done by him to sound and undiseased parts of the plaintiff's person, which he was not called upon to treat and did not pretend to treat. If a surgeon, undertaking to remove a tumor from a person's scalp, lets his knife slip and cuts off his patient's ear, or if he undertakes to stitch a wound on the patient's cheek, and by an awkward move thrusts his needle into the patient's eye, or if a dentist, in his haste, leaves a decayed tooth in the jaw of his patient and removes one which is perfectly sound and serviceable, the charitable presumptions, which ordinarily protect the practitioner against legal blame where his treatment is unsuccessful, are not here available. "It is a matter of common knowledge and observation that such things do not ordinarily attend the service of one possessing ordinary skill and experience in the delicate work of surgery. It does not need scientific knowledge or training to understand that, ordinarily speaking, such results are unnecessary and are not to be anticipated, if reasonable care be exercised by the operator."

The affirmance in this case of the judgment against the defendant, said the court of appeal, will serve to confine the rule of res ipsa loquitur within the limits intended and, while preserving to the physician all of the intended protection of the law, will give to a helpless unconscious patient an assurance of the law's solicitude in his behalf.

Sacro-Iliac Strain Aggravated by Sinus Infection

(Graybar Electric Co., Inc., v. Industrial Commission of Utah et al. (Utah), 276 P. 161)

In the course of his regular employment, while putting into stock some heavy coils of wire, Frendt felt a sharp pain in his left side, in the region of the groin. He was nauseated, and as the pain did not subside he quit work and reported the matter to his foreman. A few days later, while engaged in heavy lifting, he felt a severe pain in his back and another pain in the left side above the groin. His condition was such that his employer sent him to a physician, and then it was found that he had an incomplete hernia on the left side and a sacro-iliac strain. About two weeks after the incident first referred to, Frendt was operated on for the hernia and made an uneventful recovery. The sacro-iliac condition, however, did not respond to treatment. The evidence showed that Frendt had a chronic sinus infection. One physician testified that the pain in the back might be "arthritis of the lumbar sacro or sacro-iliac joint," and that it was the result of the injury, plus infection from the nasal condition. Another physician testified that Frendt's condition was "chronic infective arthritis of left sacro-iliac joint, possibly superimposed upon an injury." At the time of the hearing, Frendt was wearing his brace or corset, still complaining of pain and soreness in the back, and unable to work. The industrial commission found that the applicant, when he received the sacro-iliac strain, was afflicted with sinus trouble, which as a result of said injury became localized in his back. It found further that he was totally disabled from a date about one year after the initial injury and would in all probability continue to be totally disabled until he received proper medical treatment for the chronic sinus infection. From an order of the commission awarding compensation, the employer appealed to the supreme court of Utah.

The employer did not deny that the employee was injured in the course of his employment but contended that the injury was not the result of an accident. There was infection in Frendt's system, it claimed, which had made itself manifest by the pain in the back or the sacro-iliac strain; whatever Frendt's physical condition may have been from the sinus trouble or infection, there was nothing in connection with his employment of an accidental nature which was responsible for his trouble. It was not caused by an accident, asserted the employer and if it could be termed an injury, it was not attributable to an accident.

It is no longer open to question in Utah, said the supreme court, that, other necessary conditions being present, a pre-existing disease or other disturbed condition of the physical structure of the body is compensable under the workmen's compensation act, if it is aggravated or lighted up by an accident. The decided weight of authority, under statutes similar to that of Utah, is to the effect that strained effort or overexertion may cause an accidental injury for which compensation will be allowed. The underlying principle seems to be that the injury must happen suddenly, undesignedly and unexpectedly, and at a definite time and place. Quoting Lord McNaughton in *Fenton* v. *Thorley & Co.*, A. C. 443, 72 L. J. K. B. (N. S.), 787, the court said: "If a man in lifting a weight or trying to move something not easily moved were to strain a muscle or rick his back or rupture himself the mishap, in ordinary parlance, would be described as an accident." There was competent evidence to support the finding that the injury to the back was caused by an accident as that word has been defined by the text-writers and the decisions of the courts. The award of the industrial commission was therefore affirmed.

Workmen's Compensation: "Loss" of Both Legs; Permanent Total Disability.—As the result of fractures of the second and third lumbar vertebrae, the plaintiff lost the use of both legs "industrially." He could do nothing that required the use of his legs, except drag himself around. He sought to recover compensation under section 3139 of the workmen's compensation act of Utah, which fixes the compensation to be paid in cases of "permanent total disability" and provides that the "loss" of both legs shall constitute total and permanent disability. The supreme court of Utah, however, concluded that the overwhelming weight of authority and the better reasoned cases supported the view that the loss of a member means the loss by severance. In the absence from the act of language indicating that the loss of the use of a member is equivalent to the loss of a member, the courts are not authorized to read such construction into the law. The fact, however, that the legislature has declared in express terms that the loss of any two of certain specified members of the body shall constitute permanent total disability is not exclusive, nor is it inconsistent with a construction of the act that in all cases of permanent total disability from other causes the injured employee shall be entitled to the award provided by the act for such disability.

On the other hand, if an injured employee is not prevented by his injuries from securing and retaining remunerative employment and can perform the duties of such employment without pain or suffering and without unduly endangering his health, life or limb, he is not totally disabled, and he must put forth an active effort to procure such work as he is able to perform. It is a matter of common knowledge, said the supreme court, that persons with injuries similar to those sustained by the plaintiff are able to perform, and do perform, duties of some kinds, and therefore it could not be said as a matter of law that the applicant for compensation is unable to secure any kind of employment and perform the duties incident to it. That phase of the case does not seem to have been inquired into. The award of compensation as for total disability was therefore annulled and the cause remanded to the industrial commission for further proceedings.—*Spring Canyon Coal Co. v. Industrial Commission of Utah et al. (Utah), 277 P. 206.*

Narcotics: Physician's Prescription for Unlawful Quantities No Defense.—The Compiled Statutes of Oklahoma, 1921, section 8887, make it unlawful for any person to have in his or her possession or under his or her control more than one dose of certain narcotic drugs, and that one dose must have been procured on the prescription of a physician, for legitimate medicinal use. Officers found in the residence of the appellant 2½ grains of morphine tablets. The undisputed evidence showed that the usual dose of morphine is one-fourth grain and that one-half grain is the maximum that can be safely given. The appellant admitted the possession of morphine in a quantity forbidden by law, but she contended that it was prescribed by a physician for illness and to relieve pain and that its possession under such circumstances was lawful. To corroborate that testimony, she introduced the testimony of the physician who gave the prescription and of a druggist who filled it. The prosecution produced testimony, however, indicating that she and her codefendant were engaged in disposing of or administering narcotics. From a conviction of having the unlawful possession of narcotics, the appellant appealed to the criminal court of appeals of Oklahoma. The quantity of narcotics possessed by the appellant, said the court, was more than that permitted to be possessed at any one time, under any circumstances, by any one other than a physician, pharmacist, or certain persons engaged in excepted businesses. If the evidence showed that these narcotics were acquired of a registered pharmacist on a prescription from a physician, it showed that both acted unlawfully, and proof that possession was acquired in that manner would not be a defense. The purpose of the statute is to limit the dispensing, administering and use of narcotics to legitimate medicinal purposes. The possession of narcotics in the quantity shown to have been possessed by the appellant was clearly within the inhibition of the statute. The judgment of conviction was affirmed.—*Arnold v. State (Okla.), 276 P. 242.*

Malpractice: Abscess Following Hypodermic Injection by Nurse.—After an injection of ergot by a hospital nurse at the direction of the attending physician, an abscess developed. In a suit for malpractice the patient and her husband charged that the physician was negligent in that he made no inspection of the hypodermic needle prior to its use, gave no directions as to the place where the injection should be made and as to the manner and method of injecting, and permitted the injection to be given by a nurse. Admitting all of this, the court concluded, it does not necessarily follow that the physician was culpably negligent; his culpability depends on the conditions and circumstances under which the injection was given. Had the patient been delivered in a private home where no antecedent preparations had been made, then unquestionably a physician would be negligent in allowing a hypodermic injection to be given without proper precautions, taken either at the time or at some prior time in anticipation of the necessity of its administration. But the delivery here took place in a well appointed and well equipped hospital, where emergencies were anticipated and prepared for in advance, where instruments were sterilized and kept for emergency uses, and where the physician was surrounded by trained assistants. The physician in the present instance knew of these conditions, and it would be too much to say that he was negligent in relying on them. The fact that he permitted the injection to be given by a nurse would not of itself give rise to an inference of negligence. Possibly, if it had been left to the nurse to determine whether or not the drug should be administered, it could be urged with some reason that the physician was negligent; but the act of administering the drug was mechanical, a part of the routine work of the nurse, and it was shown that the nurses in the hospital had been carefully and fully instructed in the mechanics of the art. The verdict directed by the trial court in favor of the defendants was affirmed.—*Thomson et ux. v. Virginia Mason Hospital et al. (Wash.), 277 P. 691.*

Workmen's Compensation: Potential or Congenital Hernia and Compensation.—Under the compensation act of Minnesota an injury is compensable when it excites, stimulates, arouses or moves to action an existing latent condition so as to result in disability. Therefore medical theory of hernia as the result of a disease has little or no bearing on hernia as the cause of industrial disability. We are concerned with the legal cause only. The injury caused a weak place in the body to give way. It is not important that the place was normally weak. It was overloaded. It gave way because of the strain and effort to move the box in the discharge of the employee's duty. The injury changed the normal to the abnormal. There was a change in the physical structure of the body. The evidence shows conclusively that the injury received while moving the box was at least the incitation. For the purposes of the compensation act, that is sufficient.—*Bauman v. Roth Downs Mfg. Co. et al. (Minn.), 224 N. W. 459.*

"Malpractice," as Applied to Nurses.—The expression "malpractice" as used by the legislature of the state of New York in subdivision 1 of section 50 of the Civil Practice Act, defining the limitations of civil actions, was intended to apply and does apply to improper treatment of disease or injury by a nurse, through ignorance, carelessness or criminal intent. A nurse is entitled to take advantage of the two-year limitation fixed by the statute cited, in actions for malpractice, and is not relegated to the three-year period fixed for actions to recover damages for personal injuries resulting from negligence in general.—*Isenstein v. Malcomson et al. (N. Y.), 234 N. Y. S. 52.*

Insurance: Loss of Eye.—The appellant agreed to indemnify the appellee against the loss of an eye "by removal of the eyeball from the body." As the result of an injury, the appellee lost totally and permanently the sight in her right eye, but the eyeball was not removed. The trial court decided that she was not entitled to the agreed indemnity, but the court of civil appeals for the second district (Texas) reversed that judgment and rendered a judgment in her favor. *8 S. W. (2d) 679.* On the recommendation of the commission of appeals, however, the judgment of the court of civil appeals was reversed and the judgment of the trial court affirmed. The parties to the contract having by clear and unambiguous language provided for indemnity for loss of an eye by removal of the eyeball from the body, the loss of an eye or of its use by any other means or from any other cause cannot, in the absence of grounds for equity jurisdiction be treated by courts as coming within the terms of the contract. To do so would be to make a contract for the parties which they themselves did not see fit to make.—*Sextet Local Mutual Aid Ass'n v. Covington et al. (Texas), 15 S. W. (2d) 614.*

Society Proceedings

COMING MEETINGS

American College of Physicians, Minneapolis, February 10-17. Mr. E. R. Loveland, 133 South 36th Street, Philadelphia, Executive Secretary.
American Heart Association, New York, February 3. Dr. I. C. Riggin, 370 Seventh Avenue, New York, Executive Secretary.
American Society for the Study of Disorders of Speech, New York, December 30-January 1. Dr. Sara M. Stinchfield, Mt. Holyoke College, South Hadley, Mass., Secretary.
Medical Association of Porto Rico, San Juan, December 21-23. Dr. M. Pavia Fernandez, Salvador Brau 79, San Juan, Secretary.
Pacific Coast Surgical Association, Del Monte, Calif., February 7-8. Dr. E. L. Gilcreest, 384 Post Street, San Francisco, Secretary.
Society of American Bacteriologists, Ames, Iowa, December 30-January 1. Dr. James M. Sherman, Cornell University, Ithaca, N. Y., Secretary.

Current Medical Literature

AMERICAN

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Titles marked with an asterisk (*) are abstracted below.

American J. Obstet. & Gynecology, St. Louis

18: 603-756 (Nov.) 1929

Ovarian Hypofunction, Habitually Delayed and Scanty Menstruation; Sterility and Lowered Fertility. I. C. Rubin, New York.—p. 603.
*Breech Deliveries During Five-Year Period at Sloane Hospital for Women. W. E. Caldwell and W. E. Studdiford, New York.—p. 623.
*Active Immunization of Pregnant and Puerperal Women with Streptococcal Toxins Against Streptococcal Puerperal Fever. A. F. Lash, Chicago.—p. 639.
*Present Status of Cesarean Section with Particular Reference to Employment in Eclampsia. F. G. DuBose, Selma, Ala.—p. 653.
*Explosion of Ethylene Gas Resulting in Death of Maternity Patient and Child. R. Peterson, Ann Arbor, Mich.—p. 659.
Proliferative Ovarian Tumors. G. V. S. Smith, Brookline, Mass.—p. 666.
Etiology of Adenomyositis and Uterine Fibromyoma: Hypothesis. G. L. Moench, New York.—p. 682.
Gonorrhea in Female. L. E. Burch, Nashville, Tenn.—p. 689.
Amenorrhea During Serial Roentgen Exposures Due to Intervening Pregnancy. L. Goldstein and D. P. Murphy, Philadelphia.—p. 696.

Breech Deliveries During Five-Year Period at Sloane Hospital for Women.—During the years 1923 to 1927 inclusive there were 348 breech deliveries in the Sloane Hospital for Women. Ninety-two of the babies were macerated. The remaining 256 cases are analyzed by Caldwell and Studdiford. One hundred and thirty-three of the patients were primiparas, with eleven stillbirths, a gross infant mortality of 8.3 per cent. There were 123 multiparas, with twenty-five stillbirths, a gross infant mortality of 20 per cent. The gross mortality in these 256 cases, including all stillbirths and neonatal deaths, was 14 per cent. In order to decrease the infant mortality the authors emphasize the necessity of better prenatal care, including external version in proper cases; the thorough study of each individual case, multipara as well as primipara, in order to anticipate complications as much as possible; greater use of cesarean section in elderly primiparas and in contracted pelves in which not only the unmolded aftercoming head but difficulty with the cervix must be considered; a "hands off" policy as long as the labor is advancing; constant watchful care throughout the labor to prevent complications or to intervene when they occur, using sedatives with great caution. In breech extractions, sufficient time should be taken under deep anesthesia to prepare the birth canal, to prevent torsion and angulation of the child and to prevent and correct impactions gently. The cord can be compressed or even cut without great danger to the child.

Active Immunization of Pregnant and Puerperal Women with Streptococcal Toxins Against Streptococcal Puerperal Fever.—An investigation was made by Lash to determine the value of vaccination with streptococcal toxins in pregnant and puerperal women as a prophylaxis against streptococcal puerperal fever. As it is established that the toxin produced by *Streptococcus hemolyticus* obtained from puerperal fever patients has antigenic properties, it was added to the vaccine. The resulting mixture contained, therefore, all the streptococcal toxins. Among 1,216 puerperal women there was an incidence of 2.8 per cent of puerperal fever, and among 1,261 puerperal women vaccinated with streptococcal toxins only an incidence of 0.87 per cent. There was no evidence of a negative phase after inoculation with streptococcal toxins. The lowest incidence of puerperal fever was in the group in which toxins were administered before and after delivery; that is, 0.51 per cent. This suggests the added advantage of two doses of toxins, one being given from three to four weeks before and one immediately after delivery. Since it is not feasible nor necessary to immunize every expectant mother, it is suggested that the pregnant negro women and all pregnant women with probable operative deliveries or with frequent streptococcal infections elsewhere in the body should receive vaccination with streptococcal toxins.

Present Status of Cesarean Section, with Particular Reference to Employment in Eclampsia.—DuBose analyzes 100 consecutive cesarean sections done since 1915. Since 1925 there have been forty-five without a maternal death. Local anesthesia was employed in almost every case. In the previous fifty-five cases there were two maternal deaths. There were no fetal deaths when the operation was done after the seventh month of gestation, except when intra-uterine death occurred previous to the operation. One infant just past the sixth month, weighing 2 pounds when delivered, survived; and one delivered from a dying eclamptic woman in the early part of the seventh month, weighing 4 pounds, survived. More than two thirds of the patients in this series were operated on because of the toxemia or nephritis of pregnancy, half of whom had eclampsia. In this group there were two maternal deaths; one patient was moribund at the time of operation, the other from a cerebral apoplectic stroke four days after operation. The next largest number was for placenta praevia. Five per cent of the entire group had previous cesarean sections; 3 per cent were elderly primiparas, and 3 per cent of the operations were for deformities of the pelvic outlet.

Explosion of Ethylene Gas Resulting in Death of Maternity Patient and Child.—The mixture employed in the case reported by Peterson was ethylene and oxygen, 25 per cent of the former and 75 per cent of the latter in a McKesson apparatus. The practice has prevailed with maternity patients to ask them to breathe deeply three times at the beginning of a pain. The mask is then removed from the face and the patient urged to bear down. In the latter part of the second stage when the head is extended over the perineum, it is customary to increase the amount of ethylene and decrease the proportion of oxygen until practically complete anesthesia is produced. The explosion occurred at approximately 10:10 p. m. It was violent and loud enough to be heard throughout the four-storied maternity building. The anesthetist was partly blown from her chair but escaped serious injury. The gas machine was seen to be on fire, but the flames were promptly extinguished by means of a blanket. Immediately after the explosion the patient cried out and attempted to rise to a sitting posture on the delivery table. After resuming the recumbent position she went into opisthotonos, began coughing up large quantities of foamy blood, and became unconscious. The table was lowered to the Trendelenburg position to facilitate the emptying from the throat and mouth of constantly increasing amounts of blood. Finally a tracheotomy was performed in the vain hope that it might be of some avail. Almost immediately after the accident the patient's neck and face became greatly swollen and distorted by a marked emphysema. The heartbeat was at first fairly strong but gradually became weaker until death at 11 o'clock. At the time of the explosion crowning was taking place and the baby would have been born within a few minutes. After the accident the fetal head receded within the greatly relaxed introitus. The fetal heart could not be heard, any possible sounds, however, being obscured by the patient's noisy respirations. Although it was thought improbable that the fetus was alive, it was deemed advisable to extract it on a chance that it might be saved. Forceps were applied half an hour after the accident and the child easily delivered by slight traction owing to the excessive relaxation present. The fetus showed no signs of life and all attempts at resuscitation were unavailing. Necropsy revealed multiple lacerations of the lower part of the trachea, of the great bronchi and of the parenchyma of the lungs; massive hemorrhages throughout the lungs; interstitial emphysema of the upper half of the body; fatty degenerative infiltration of the liver; subepicardial fatty infiltration with moderate right-sided cardiac dilatation; lipoidosis of the suprarenals; puerperal changes in the uterus with laceration of the cervix; tracheotomy wounds; acute passive congestion of all organs, and edema of the meninges and the brain.

American J. Pathology, Boston

5: 545-684 (Nov.) 1929

Finer Histology of Normal Glomerulus. L. McGregor, Minneapolis.—p. 545.
Cytologic Changes Occurring in Glomerulus of Clinical Glomerulonephritis. L. McGregor, Minneapolis.—p. 559.
*Lipoid Nephrosis. E. T. Bell, Minneapolis.—p. 587.
*Carbon Tetrachloride Poisoning with Macroscopic Fat in Pulmonary Artery. H. E. MacMahon and S. Weiss, Boston.—p. 623.
Experimental Obstructive Cirrhosis. H. E. MacMahon, J. S. Lawrence and S. J. Maddock, Boston.—p. 631.
*Obstructive Cirrhosis. H. E. MacMahon and F. B. Mallory, Boston.—p. 645.
Meningioma in Supravital Preparations, Tissue Culture and Paraffin Sections. R. C. Buckley and L. Eisenhardt, Boston.—p. 659.

Lipoid Nephrosis.—According to Bell, all the clinical phenomena of lipoid nephrosis, viz., albuminuria, edema, normal blood pressure, hypercholesterolemia, decrease of the plasma proteins with reversal of the albumin globulin ratio and normal blood nitrogen, may occur in a less pronounced form in glomerulonephritis. There are many transition cases between lipoid nephrosis and glomerulonephritis; namely, those that fit the definition of lipoid nephrosis except for the presence of hypertension or moderate nitrogen retention. These are called the mixed type, or nephritis with a nephrotic *einschlag*. From the clinical standpoint the two diseases cannot be sharply separated. He made a histologic study of ten cases of large, fatty kidneys, without tubular atrophy, that were clinically nephritis. Four of these are classed as pure lipoid nephrosis, three as nephritis with nephrotic *einschlag* (mixed type) and three as of uncertain type because of lack of clinical data. The glomeruli are not normal in any instance, but the lesions are not of uniform type. In pure lipoid nephrosis there is a varying increase in the number and size of the glomerular endothelial cells and an uneven thickening of the basement membrane. In the mixed type (nephritis with nephrotic *einschlag*) there is a marked thickening of the basement membrane. In one instance the capillaries were compressed by enlarged epithelial cells. In two instances there was a definite increase in the number and size of the glomerular endothelial cells, and a few areas in the glomeruli showed the changes characteristic of typical clinical glomerulonephritis, i. e., capillaries filled with endothelial cells and a network of hyaline fibers. Three large noncontracted kidneys were studied in which the data were insufficient to determine whether they should be classed as lipoid nephrosis. Two of these showed extreme thickening of the basement membrane. The third showed an enormous accumulation of fat in the tubules and glomeruli, large glomerular epithelial cells with hyaline and fatty degeneration, and leukocytes and hyaline fibers within the capillaries as in glomerulonephritis. Lipoid nephrosis is to be regarded as a form of glomerulonephritis in which the glomeruli are injured but their capillaries are only partially obstructed, so that they continue to function.

Carbon Tetrachloride Poisoning with Macroscopic Fat in Pulmonary Artery.—The gross and microscopic observations are described by MacMahon and Weiss in an unusual case of carbon tetrachloride poisoning in which the blood in the right side of the heart and larger pulmonary arteries contained an extremely high percentage of fat (60 per cent). The severe injury to the liver, which was already large and filled with fat, was the probable source of the fat in the vascular system. Fat droplets that were small enough to pass through the capillaries of the lung and to gain entrance into the capillaries of the other organs produced no microscopic lesions in the heart, brain or kidney. It appears from these observations that the sensitiveness of alcoholic patients to carbon tetrachloride is increased not only because of increased absorption of the drug, as well as the synergistic action of alcohol and carbon tetrachloride together in producing liver injury, but also because of the possible presence of preexisting liver injury.

Obstructive Cirrhosis.—MacMahon and Mallory report the results of their study of thirty cases of uncomplicated obstructive cirrhosis, ten in infants and twenty in adults averaging about 60 years of age. The common cause in infancy is a congenital malformation of the bile duct, whereas in the adult eight resulted from tumors about the head of the pancreas and ampulla of Vater, eight from stones in the common duct, and four from benign strictures. Of this series only five of the cases were in females, and in each of these cases the obstruction was due to stones. Jaundice, hemorrhages, pigmentation of the urine and clay colored stools were the outstanding features. Nutrition in most cases was well maintained for some time in spite of the severity of the lesion, but later the health inevitably gave way and the child rapidly lost weight and strength. The longest surviving patient lived for four and a half months.

American J. Roentgenology & Rad. Therapy, New York

22: 305-400 (Oct.) 1929

*Significance of Calcified Abdominal Lymph Nodes. R. Golden and R. J. Reeves, New York.—p. 305.
*Activated Ergosterol in Radiation Sickness. L. A. Smith, Indianapolis.—p. 317.
*Etiology of Ill Health in Children Born After Maternal Pelvic Irradiation. L. Goldstein and D. P. Murphy, Philadelphia.—p. 322.
Distortion in Roentgenograms Taken at Various Target Film Distances. F. D. Andrew and S. L. Warren, Rochester, N. Y.—p. 332.
*Hereditary Deforming Chondrodysplasia. T. Leucutia and A. E. Price, Detroit.—p. 338.
Giant Cell Tumor of Radius with Poor Result from Roentgen Therapy: Case. M. C. Sosman, Boston.—p. 346.
Acute Pulmonary Edema of Anaphylactic Shock: Case. H. F. Day, W. R. Sisson and E. C. Vogt, Boston.—p. 349.
Fibrosarcoma of Mediastinum: Case. S. A. Robins, Boston.—p. 351.
Hernia of Urinary Bladder: Case. S. A. Robins, Boston.—p. 353.
Carcinoma of Stomach in Man Aged Twenty-Four. B. M. Bernstein, New York.—p. 354.
Roentgenologic Examination of Duodenum: Value of Oblique Roentgenography. R. C. Pendergrass, Americus, Ga.—p. 355.

Significance of Calcified Abdominal Lymph Nodes.—According to Golden and Reeves, calcified mesenteric lymph nodes may be innocuous or may coexist with other abdominal diseases, but their shadows on the roentgenogram frequently offer a solution for an otherwise puzzling clinical problem.

Viosterol in Radiation Sickness.—The clinical results of the oral administration of viosterol in early radiation sickness are described by Smith. Marked relief of all symptoms is usually effected, except possibly diarrhea. Used as a prophylactic, viosterol prevents all symptoms to a marked degree. These results apparently occur in both radium and roentgen treatment. Many of the patients experience an unusual sense of well being and increased appetite. The action is probably effected in some way through the calcium-phosphorus metabolism. There is some evidence that the final effect may be brought about through prevention or reduction of hyperirritability of the vagus.

Etiology of Ill Health in Children Born After Maternal Pelvic Irradiation.—The etiology of the ill health or defects manifested by thirty-eight of a group of seventy-five children irradiated while in utero has been investigated by Goldstein and Murphy. The ill health of ten children was attributed to parental influences or to accidental causes. Twenty-eight, or 37.3 per cent, of the seventy-five children born after postconception radium or roentgen irradiation manifested mental or physical abnormalities which could not be attributed to parental influences, accidental diseases, or causes other than irradiation. In this group of twenty-eight children there were twenty children who suffered severe disturbances of the central nervous system. Sixteen microcephalic children were included in this group. The remaining eight children exhibited other serious disturbances of health and development, which may have resulted from the irradiation received while in utero. The large number of grave malformations appearing in the children born after postconception irradiation, the uniformity of these deformities (chiefly microcephaly and other mental defects), and the infrequency of microcephaly in the general population (one in 10,000 or more births) all strongly indicate that there is a distinct relation between postconception irradiation and the occurrence of mental defects in children born after such irradiation. The occurrence of two cases of microcephaly and one case of hydrocephaly in children born of women irradiated after the fifth month of pregnancy indicates the danger of irradiation of the fetus in the advanced stages of development. The authors believe that therapeutic pelvic irradiation during pregnancy is extremely likely to injure seriously the growing embryo, and that such injury may result in the birth of a seriously defective child. It is concluded that there is no indication that diagnostic pelvic irradiation during pregnancy is deleterious in any way to the health of subsequent offspring.

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Hereditary Deforming Chondrodysplasia.—Leucutia and Price report two cases occurring in mother and son. The disturbances observed were so uniform that the hereditary character of the lesion at once became apparent. The only cauliflower-like exostoses observed in each case were in connection with the lower portion of the right femur, the only difference being that in the mother the exostosis occurred on the inner aspect of the femur, while in the son it was localized to the outer aspect. This, in the authors' estimation, forms the most conclusive proof that the condition is of an hereditary nature. On the other hand, it indicates that the skeletal changes are the result of more or less uniform disturbances in the proliferation and ossification of bone-forming cartilage during the period of development as described by Ehrenfried, and not an incidental anomaly of the perichondrium and periosteum as suggested by Müller. For the same reason, they consider "hereditary deforming chondrodysplasia" as the most appropriate term.

Archives of Physical Therapy, X-Ray, Radium, Omaha

10: 481-525 (Nov.) 1929

Diathermy Treatment of Uterine Cervical Lesions. F. M. Mikels, Long Beach and Hollywood, Calif.—p. 481.
Zinc Ionization in Treatment of Intumescent Rhinitis. J. Gale, Gary, Ind.—p. 486.
Value of Intranasal Ultraviolet Irradiation as Aid in Therapy of Nasal Accessory Sinus Diseases. R. G. Reaves, Knoxville, Tenn.—p. 488.
Low Tension Currents in Treatment of Certain Paralyses. W. Martin, Atlantic City, N. J.—p. 491.
Electrocoagulation of Tonsils: New Technic. L. L. Doane, Butler, Pa. —p. 495.
Physiologic Action and Therapeutic Value of General and Local Whirlpool Baths. C. Pope, Louisville, Ky.—p. 498.
Electrosterilization of Tonsils. W. L. Cahall, Utica, N. Y.—p. 500.
Effect of Physical Therapy on Eye. F. L. Alloway, Chicago.—p. 502.
Chronic Suppurative Otitis Media, Chronic Maxillary Sinusitis, Simple Chronic Laryngitis. A. R. Hollender, Chicago.—p. 503.

Indiana State M. Assn. Journal, Fort Wayne

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Epidemiology of Tuberculosis in Indiana. T. B. Rice, Indianapolis.—p. 465.
What Can We Do For the Patient With Nervous Indigestion? W. C. Alvarez, Rochester, Minn.—p. 479.
Blood Vessel Surgery: Three Cases. J. Y. Welborn, Evansville.—p. 482.
Treatment of Glaucoma. H. A. Kuhn, Hammond.—p. 483.
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Journal of Comparative Neurology, Philadelphia

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Postnatal Growth in Area in Median and Sciatic Nerves of Albino Rat According to Sex: Fixation in Bouin's Solution. K. Ide, Philadelphia. —p. 355.
Areas of Cross Sections of Median and Sciatic Nerves of Albino Rat According to Sex After Osmic Acid Fixation. K. Ide, Philadelphia. —p. 373.
Crossed Extensor Reflex in Decerebrated Muscle After Transection of Brain Stem at Varying Levels. S. W. Ranson and J. C. Hinsey, Chicago.—p. 393.
Postnatal Growth of Cornea and Palpebral Fissure and Projection of Eyeball in Early Life. C. Hymes, Minneapolis.—p. 415.
Structure of Cells in Tissues as Revealed by Microdissection: Neurofibrils in Living Nervous Tissue of Lobster (Homarus Americanus). G. S. de Rényi, Philadelphia.—p. 441.
Is Myelinogeny an Absolute Index of Behavioral Capability? A. W. Angulo y González, Philadelphia.—p. 459.
Nerve Terminations in Lateral-Line Organs of Amblystoma. O. Larsell, Portland.—p. 465.
Development of Dentate Nucleus in Pig. L. W. Dowd, Chicago.—p. 471.

Journal of Industrial Hygiene, Baltimore

11: 293-328 (Nov.) 1929

Evaluation of Five and Seven Per Cent Carbon Dioxide Mixtures as Respiratory Stimulants. E. Heller, W. Killiches and C. K. Drinker, Boston.—p. 293.
*Use of Seven Per Cent Carbon Dioxide and Ninety-Three Per Cent Oxygen in Treatment of Carbon Monoxide Poisoning. C. K. Drinker and R. J. Shaughnessy, Boston.—p. 301.
Physiologic Reactions to Cooling Power During Work: Evaporation of Water. J. A. Campbell and T. C. Angus, Hampstead, London.—p. 315.

Use of Seven Per Cent Carbon Dioxide and Ninety-Three Per Cent Oxygen in Treatment of Carbon Monoxide Poisoning.—A study made by Drinker and Shaughnessy of their experience since 1923 in the use and experimental examination of the effects of 5 per cent carbon dioxide and 95 per cent oxygen in the treatment of carbon monoxide poisoning has indicated the wisdom of increasing the concentration of carbon dioxide to 7 per cent for the first five to twenty minutes of treatment. The principal reasons for making this change are: (*a*) The fact that a certain number of persons respond to carbon dioxide stimulation of breathing with comparatively slight increase when 5 per cent carbon dioxide is used, whereas with 7 per cent there is satisfactory augmentation. (*b*) The response to carbon dioxide stimulation is lowered in dangerous carbon monoxide poisoning, and a 7 per cent concentration is a better means of securing an increase in breathing of real consequence to the patient. (*c*) No experimental or clinical evidence has appeared indicating that the increase in carbon dioxide to 7 per cent carried with it the slightest danger. Indeed, all facts point to benefit to the circulation from 7 per cent carbon dioxide in 93 per cent oxygen. Three hundred cases of carbon monoxide poisoning have been treated by employing an initial inhalation of 7 per cent carbon dioxide and 93 per cent oxygen for from five to twenty minutes, and completing the treatment with the usual 5 per cent carbon dioxide mixture. The results of this field work have been uniformly good. Breathing is more active, consciousness returns more rapidly, and after-effects have not been noteworthy.

Journal of Lab. & Clin. Medicine, St. Louis

15: 109-204 (Nov.) 1929

*Organism Isolated from Malignant Tumors. E. W. Stearn, B. F. Sturdivant and A. E. Stearn, Pasadena, Calif.—p. 109.
*Effect of Colloidal and Crystalloidal Metallic Compounds in Nutritional Anemia of Rat. A. Goerner, New York.—p. 119.
*Bronchomoniliasis Caused by Monilia Metalondinesis. H. Wheelon and R. E. Hoffstadt, Seattle.—p. 122.
Effect of Guanidine Compounds on Unanesthetized Dogs. R. H. Major and C. J. Weber, Kansas City, Kan.—p. 125.
Pharmacology of Local Anesthetics: I. Terminal Infiltration of Local Anesthetics by Dermal Wheal Method on Guinea-Pigs. C. L. Rose, Indianapolis.—p. 128.
Alimentary Tract of Man: IV. Reflex Effect of Heat and Cold on Gastric Responses. W. Kuenzel and T. W. Todd, Cleveland.—p. 132.
Id.: V. Disturbances of Central Origin in Gastric Responses. T. W. Todd and W. Kuenzel, Cleveland.—p. 142.
New Folin Micromethod for Determination of Blood Sugar. S. L. Leiboff and D. Koppel, New York.—p. 151.
Modifications in Determination of Nonprotein Nitrogen in Blood. S. L. Leiboff, New York.—p. 155.
Pollen Suspensions. J. A. Murphy, Philadelphia.—p. 158.
Spectrophotometric Determination of Hematoporphyrin in Urine. C. Sheard, A. E. Osterberg and W. H. Goeckerman, Rochester, Minn. —p. 162.
Method for Staining of Polar Bodies. E. Weiss, Chicago.—p. 170.
New Centrifuge Tube for Volume Index Determinations (Modified Haden Method). A. H. Sanford and T. B. Magath, Rochester, Minn.—p. 172.
Modification of Simpson Method of Frog Heart Perfusion. E. Vogt, Augusta, Ga.—p. 174.
Modification of Morse-Kopeloff Anaerobic Method. P. A. Tetrault, Madison, Wis.—p. 177.
Useful Medium for Cultivation of Gonococcus and Allied Organisms. R. S. Spray, Morgantown, W. Va.—p. 179.
Exploration Electrode to Determine Hydrogen Ion Concentration of Fluids in Living Tissue. H. Ehrenberg, San Francisco.—p. 181.
Convenient Modification of Biuret Test. D. H. Kling, Los Angeles.—p. 185.
Modification of Orskov Single Cell Technic. D. C. B. Duff, Toronto, Canada.—p. 186.

Organism Isolated from Malignant Tumors.—Stearn et al. discuss finding an organism in tumor tissue and in a tumor mass from a rat which had received five injections of the minute coccobacillus cultivated from a human source during a period of five months. Strong positive precipitin reactions were obtained with serums from cancer patients, while those from normal persons remained negative. Blood from a person suffering from a multiple uterine fibroid gave a positive precipitin test. The problem of the pathogenicity of the organism remains open since the only animals so far used for experimentation were rabbits, guinea-pigs and rats.

Effect of Colloidal and Crystalloidal Metallic Compounds in Nutritional Anemia of Rat.—After animals had been rendered anemic on a diet of powdered milk and distilled water, Goerner gave them solutions of metallic compounds in addition to the powdered milk and distilled water. Crystalline salts of manganese as well as of copper increased the hemoglobin of these animals when these salts were added to iron salts. Pure crystalline iron salts in solution did not have the same pronounced effect. Crystalline salts of zinc and aluminum when added to iron salts failed to show any marked hemo-

globin increase. Colloidal solutions of manganese and copper in the presence of colloidal solutions of iron did not have this hemoglobin-producing power when administered in quantities comparable to the crystalline salts, nor have the former the power of preventing the reduction of hemoglobin when the animals are placed on a diet capable of producing severe anemia.

Bronchomoniliasis Caused by Monilia Metalondinensis.—In the case reported by Wheelon and Hoffstadt a diagnosis of acute general respiratory infection of influenzal nature was made. However, the laboratory observations ultimately led to the diagnosis of a respiratory fungus infection. The cultural characteristic agreed with that of *Monilia metalondinensis* as described by Castellani.

Journal of Nutrition, Springfield, Ill.

2: 111-215 (Nov.) 1929

Isolation of Narrow Spectral Regions by Selective Absorption. L. A. Jones, Rochester, N. Y.—p. 111.
Use of Isolated Radiations in Experiments with Rat: I. Effect of Infra-Red Radiation on Growth of Rachitic Rat. E. M. L. Clausen, Baltimore.—p. 125.
*Do Baking Powder Residues Exert Injurious Effects on Growth and Nutrition? W. C. Rose and F. L. Catherwood, Urbana, Ill.—p. 155.
Rolled Oats and Bran in Scurvy-Producing Diet and Negative Control Test. E. W. Schwartze, F. J. Murphy and R. M. Hann, Pittsburgh.—p. 171.
Nerve Degeneration Resulting from Avitaminosis A. J. S. Hughes, H. F. Lienhardt and C. E. Aubel, Manhattan, Kan.—p. 183.
*Influence of Fiber on Nitrogen Balance and on Fat in Feces of Human Subjects. J. Whitacre, A. Willard and K. Blunt, Chicago.—p. 187.
*Nutritive Value of New Zealand Spinach. L. McLaughlin, Ames, Iowa.—p. 197.
Cyclic Variations in Basal Metabolic Rate of Women. F. A. Hitchcock and F. R. Wardwell, Columbus, Ohio.—p. 203.

Do Baking Powder Residues Exert Injurious Effects on Growth and Nutrition?—Growth experiments extending through two generations of rats have been conducted by Rose and Catherwood to determine whether baking powders exert deleterious effects. The results indicate that in the proportions ordinarily employed in the preparation of bread, and with twice these amounts, three typical baking powders in which the leavening agents are calcium acid phosphate, a tartrate, and a mixture of calcium acid phosphate and anhydrous sodium aluminum sulphate, respectively, exert no detectable toxic or injurious action. The animals receiving the powders grew as rapidly and reproduced as satisfactorily as control rats on a similar diet without baking powder. Analyses of the blood and histologic examinations of the kidneys likewise failed to reveal evidence of injury.

Influence of Fiber on Nitrogen Balance and on Fat in Feces of Human Subjects.—Experiments made by Whitacre et al. show that a high proportion of bulk in the diet tends to reduce the utilization of nitrogen to a lower plane, but that it does not have the same effect on the utilization of fat in the diet.

Nutritive Value of New Zealand Spinach.—McLaughlin states that New Zealand spinach is especially valuable in the diet because of its high salt content. It compares favorably with most green vegetables in iron and calcium. Cooked without the addition of water, it retains most of its minerals. If greens of milder flavor and brighter color are preferred, it may be boiled in water with little loss of calcium but with much loss of other minerals. However, it still retains enough to compare favorably with raw cabbage or lettuce. New Zealand spinach is exceedingly rich in vitamin A and is a good source of the vitamin B complex.

Journal of Urology, Baltimore

22: 453-592 (Nov.) 1929

Renal Compression. J. C. Ferrer, San Juan, Porto Rico.—p. 453.
Submucous Cystitis. P. F. Donohue, St. Paul.—p. 465.
Treatment of Gonorrhea and Complications. E. W. White and A. J. Holm, St. Paul.—p. 478.
Priapism: Three Cases. H. A. Berkey, Chicago.—p. 489.
*Concentration as Factor in Antiseptic Properties of Dog's Urine. E. C. White, Baltimore.—p. 501.
*Transillumination of Rectum. F. E. B. Foley, St. Paul.—p. 515.
*Nitrite Reaction as Indicator of Urinary Infection. A. Hyman and L. T. Mann, New York.—p. 521.
Unusual Forms of Spiculate Vesical Calculi. F. M. Denslow, Kansas City, Mo.—p. 527.
Extensive Bilateral Nephrolithiasis: Case. W. J. Vynalek, Berwyn, Ill.—p. 529.
Renal Tumor: Complication Leading to Early Diagnosis. W. Crane, Oakland, Calif.—p. 535.
Can Solid Material by Reflux or Antiperistalsis Enter Pelvis of Kidney from Bladder? Case Proving That It Can. T. P. Waring, Savannah, Ga.—p. 541.
Tuberculosis of Vesical Diverticulum. F. W. Schacht, Rochester, Minn.—p. 549.
Perforation of Bladder During Cystoscopic Examination. S. F. Wilhelm, New York.—p. 555.
Trichomonas Prostatovesiculitis. L. W. Riba and E. Perry, Chicago.—p. 563.
Use of Emulsified Campiodol in Urography. A. A. Kutzmann, Los Angeles.—p. 573.
New Ureteral Stone Forceps. B. Lewis, St. Louis.—p. 587.
Presentation of Cystoscope Holder. R. S. Mallard, Fort Worth, Texas.—p. 589.

Concentration as Factor in Antiseptic Properties of Dog's Urine.—White's study confirms the observations of Davis and Hain that dog's urine is frequently bactericidal toward *Bacillus coli* and only occasionally bactericidal toward *Staphylococcus*. Dog's urine is much more concentrated than human urine. The former frequently shows a freezing point depression of 3.5 degrees or more, even increasing to 4.5 degrees at times, and this without special attempts to concentrate the urine by dietary measures. Human urine, on the other hand, usually shows a depression of less than 2 degrees, and rarely as great as 3 degrees. Comparative tests were made in which *Staphylococcus aureus* and *Bacillus coli* were subjected to the bactericidal action of dog's urine and to that of nutrient broth containing increasing amounts of sodium chloride and urea. The depression of the freezing point was determined for the urine and the broths. *Staphylococcus*, when killed at all by dog's urine, was killed at concentrations even lower than those which fail to kill this organism in salt or urea broth. Hence concentration is not a factor in the bactericidal action toward *Staphylococcus aureus*. In three out of four strains of *B. coli* studied in this way, the concentration of the dog's urine was in no case sufficient to account for the sterilization observed. One strain of *B. coli* was killed by dog's urine in many cases at concentrations which also killed when reached in broth by the addition of salt of urea. In other instances the same strain was killed by dog's urine at concentrations which failed to kill when reached in broth. It is therefore concluded that at least two factors may contribute to the bactericidal action of dog's urine toward *B. coli*. One of these factors is yet undetermined; the other is, in some cases, mere concentration. In those cases in which concentration alone is sufficient to account for sterilization, the other unknown factor may also be active at the same time. Sterile salt and sterile urea were added to human urine so as to bring it up to the concentrations practically attainable. In no case did this urine become sterile when inoculated with *B. coli* and incubated for twenty-four hours. In some cases there was, however, marked retardation of growth as compared with growth in the original urine similarly inoculated. This observation suggests the possibility that concentrated urine may aid the action of drugs used in urinary infections.

Transillumination of Rectum.—Perineal prostatectomy possesses certain distinct advantages over the suprapubic approach but is avoided by most surgeons in favor of the suprapubic operation because of the technical difficulties of the perineal dissection. This technical difficulty is almost entirely the difficulty of dividing the recto-urethralis muscle, a necessary step in the operation in order to gain access to the prostate. Transillumination of the rectum has been found by Foley to serve as an excellent guide for division of the recto-urethralis muscle, permitting it to be cut close to its rectal attachment without fear of entering the bowel lumen and at the same time insuring against injury to the external urethral sphincter. In his hands the procedure has greatly facilitated and rendered secure a dissection formerly found hazardous and difficult.

Nitrite Reaction as Indicator of Urinary Infection.—In the preparation of the reagent used by Hyman and Mann in making this test, 0.5 Gm. of sulphanilic acid is dissolved in 150 cc. of 10 per cent acetic acid; 0.2 Gm. of alpha-naphthylamine is dissolved in 20 cc. of boiling water, and filtered into 150 cc. of 10 per cent acetic acid. These two solutions are stored in a brown bottle. The urine must be freshly voided into a sterile chemically clean container. As a normal urine contains only nitrates, and as a container that is not sterile may contain

nitrite-forming bacteria, this precaution must be strictly adhered to, as nitrite will be formed from the nitrates and one may fall into error. The specimen of urine having been properly obtained, 2 cc. of the urine is added to an equal quantity of the reagent. If there are nitrite-forming bacteria, a pink color develops immediately in a majority of instances. The reaction of the urine is of no importance, as the acetic acid in the reagent assures an acid reaction. In phosphaturia the cloudiness of the urine disappears as the precipitated salts dissolve, and no interference is found with the test. If streptococci, gonococci or tubercle bacilli are the agents causing infection, a negative test results. A negative test with a tuberculous infection is of diagnostic value, but the fact that a mixed infection with a positive test may be present must not be overlooked. If a urine is apparently badly infected and gives a negative reaction, a few drops of a 10 per cent sodium nitrate solution should be added along with the reagent, and this mixture incubated for from one-half to one hour. In the presence of nitrite-forming bacteria, a positive reaction results.

Nebraska State M. Journal, Norfolk

14: 417-456 (Nov.) 1929

Nonsurgical Gallbladder Drainage. A. L. Smith, Lincoln.—p. 417.
Undulant Fever. H. H. Waite, Lincoln.—p. 426.
Modern Views of Sympathetic Ophthalmia. S. R. Gifford, Omaha.—p. 432.
Relation of Food to Teeth in Children. F. Clarke, Omaha.—p. 438.
Hypothyroidism in Children. E. B. Reed, Lincoln.—p. 441.
Chronic Interlobar Empyema Complicating Lung Abscess. J. A. Weinberg, Omaha.—p. 445.
Horseshoe Kidney with Greatly Dilated Ureter: Case. B. R. Farner, Norfolk.—p. 447.

New England J. of Medicine, Boston

201: 1021-1074 (Nov. 21) 1929

*Latent Hyperthyroidism Masked as Heart Disease: Angina Pectoris. S. A. Levine and G. L. Walker, Boston.—p. 1021.
*Liver Function: VII. Symptomatology Associated with Hepatic Dysfunction. C. W. McClure and M. E. Huntsinger, Boston.—p. 1030.
*Tuberculosis Rate in Infants in Relation to Milk Supply. P. R. Withington, Milton, Mass.—p. 1034.
What Direction, Please? D. B. Armstrong, New York.—p. 1039.
Spirit of Lawlessness. C. B. Rugg, Worcester, Mass.—p. 1044.
Liver in Right Pleural Cavity: Case. D. E. Currier, Brookline, Mass.—p. 1048.
Psychiatry in Massachusetts Courts. W. A. Bryan, Worcester, Mass.—p. 1049.
Advisability of Including Medicolegal Medicine in Nurses' Curriculums. D. E. Currier, Brookline, Mass.—p. 1051.

Latent Hyperthyroidism Masked as Heart Disease: Angina Pectoris.—Attention is drawn by Levine and Walker to a group of patients usually treated for heart disease, in whom the underlying cause is a latent and unrecognized hyperthyroidism. The common signs and symptoms usually found in typical exophthalmic goiter and toxic adenoma are not evident in these patients. The diagnosis is even more difficult in patients who have coexisting organic heart disease, such as angina pectoris, hypertensive heart disease or mitral stenosis. Of especial interest are those with typical anginal attacks, in whom proper treatment of the latent hyperthyroidism results in a great reduction in the number of attacks, if not complete relief from symptoms. Attention is especially directed to certain points in the general appearance of the patient and in the physical observations that lead one to suspect the presence of a latent hyperthyroidism. Circulatory insufficiency is not a contraindication to surgery in the treatment of these patients, many of whom are relieved completely, and others much improved by subtotal thyroidectomy. A series of eleven cases is reported, all of which had been treated for a considerable period of time for heart disease, but in each of which there was a latent hyperthyroidism, either as the sole cause of the trouble or present as an additional burden on a heart already affected with some other organic lesion. In every case either complete cure or marked improvement was obtained, when treatment was directed at the previously unsuspected thyroid gland.

Symptomatology Associated with Hepatic Dysfunction of Liver.—Three groups of patients were studied by McClure and Huntsinger. Of these groups one had undergone cholecystectomy, a second had toxic jaundice and a third showed no organic disease. Forty-nine of the fifty-four patients were under observation from one to four years; the remaining five from one to four weeks. Except for the few patients observed less than a month, examinations of the liver's functional activity were made on several occasions. Thirty-six patients were studied in whom no organic lesions were demonstrable. The symptoms presented by twelve of the thirty-six patients were indicative of organic disease. Ten patients were observed who had experienced unfavorable results following cholecystectomy and in whom no organic cause for symptoms was demonstrable. Eight patients were observed whose condition was diagnosed as toxic (infectious, catarrhal) jaundice. The symptomatology of the group of cholecystectomized patients underwent marked change whenever the hepatic functional state was improved by treatment. The acceptance of hepatic dysfunction as the basis for the symptomatology of the various groups of patients described offers an explanation for several commonly observed clinical phenomena. It explains the pathogenesis of a certain number of the so-called functional neuroses, their chronicity and their often stubborn resistance to treatment. It offers one explanation for the unsuccessful outcome of an appreciable number of surgical operations on the gallbladder. It explains why some patients affected with chronic cholecystitis are benefited by the proper intraduodenal administration of magnesium sulphate solution, which therapy influences hepatic function.

Tuberculosis Rate in Infants in Relation to Milk Supply.—One hundred children of approximately the same social status in adjacent towns were tested by Withington with 1:1,000 tuberculin introduced intradermally. Conditions in the two towns were approximately the same except that forty-seven of the children of one town had unboiled or unpasteurized milk as against six from a second town, and that all of the raw milk of the latter group was from tuberculin tested herds, whereas none of that of the former group was. The incidence of reactors in the first group was seven times that in the second group. In the first group all of the seven positive and all but two (possibly three) of the twelve doubtful cases fell in the group of 47 per cent who had a history of having drunk raw milk. In the second group, in two of the four doubtful cases there was a definite history of exposure to tuberculosis. Of the remaining doubtful cases, one belonged in the group of 6 per cent who had drunk raw cow's milk.

New York State J. of Medicine, New York

29: 1369-1432 (Nov. 15) 1929

*Cardiovascular Effects of Direct Injury to Chest. M. H. Kahn and S. Kahn, New York.—p. 1369.
Intestinal Intoxication: 2. Bacterial Complement Fixation Tests in Infections of Gastro-Intestinal Tract. C. W. Lieb and G. H. Chapman, New York.—p. 1377.
Smoke. T. Darlington, New York.—p. 1380.
Coma Routine. L. F. Bishop, Jr., and E. Appelbaum, New York.—p. 1382.
Acute Intestinal Obstruction. J. B. Deaver, Philadelphia.—p. 1383.
Diphtheria Prevention. F. W. Laidlaw, Middletown.—p. 1390.
Psychiatric Aspect of Drug Addiction. M. Keschner, New York.—p. 1391.
Half Century of Medical Leadership. J. N. Vander Veer, Albany.—p. 1394.
Diagnosis of Pulmonary Tuberculosis for General Practitioner. L. Brown and J. N. Hayes, Saranac Lake.—p. 1395.

Cardiovascular Effects of Direct Injury to Chest.—The Kahns report a number of cases illustrating the fact that with or without injury to the ribs, or even without obvious external bruising, an external blow may produce serious injury to the intrathoracic structures. The principal clinical types of traumatic heart lesions that occur in consequence of direct and indirect violences are classified. The pericardium may react to a contusion or concussion of the chest with the development of acute pericarditis. Auricular fibrillation may follow direct violence to the chest. Extrasystolic arrhythmia may arise following injury produced in the cardiac tissue by direct trauma to the organ from blunt violence such as blows to the chest, or indirect injury as in falling from a height. The location of the trauma in the myocardial structure will predicate the functional disturbances or arrhythmia that may develop. Cases are reported of heart block from direct injury to the chest. Injury to the front of the chest, with or without injury to the ribs or even without obvious external bruising, may cause rupture of one or more of the valves in the heart. Besides injury to the aortic cusp, the wall of the vessel frequently suffers in

accidents due to direct violence to the front of the chest, with the formation of a dissecting aneurysm. A preexisting aneurysm may rupture in consequence of direct blunt violence to the thorax. A number of cases in the literature indicate strikingly that, as a direct result of external nonpenetrating violence, small foci of myocardial injury may develop. Rupture of the heart may follow nonpenetrating injuries to the chest, as well as violent effort some time after the injury has been received. The symptoms of rupture of the heart are in reality the terminal phenomena that take place. They usually consist of the momentary symptoms of collapse and sudden death. The mechanism for the occurrence of death depends on the intrapericardial pressure. When the pressure in the pericardium becomes equal to that in the right auricle, blood no longer enters the heart from the systemic veins and death promptly ensues.

Pennsylvania M. Journal, Harrisburg

33: 47-122 (Nov.) 1929

Hereditary Syphilis. P. C. Jeans, Iowa, City.—p. 47.
Plastic Surgery of Nose. S. Cohen, Philadelphia.—p. 50.
Legal Aspect of Pessary. F. A. Donlan, Cresson.—p. 52.
Routine Examination of Eye in Bearing on Present-Day Motor Traffic. C. P. Small, Chicago.—p. 55.
Child Guidance Clinics as Conducted in Public Schools of Erie, Pa. I. A. Darling, Warren.—p. 58.
Undulant Fever: Case. F. C. Sharpless, Rosemont.—p. 60.
Mumps Complicated by Thyroid Gland Enlargement. C. W. W. Elkin, Pittsburgh.—p. 62.
Traumatic Injuries to Trachea. A. J. Guerinot, Pittsburgh.—p. 62.
Eventration of Diaphragm. W. M. Kunkel, Harrisburg.—p. 63.
Perirectal Abscess Due to Gas Bacillus. J. A. Campbell, Williamsport. —p. 64.
Dysphagia Due to Hyoid Spurs; Operative Relief. E. F. Butler, Elmira, N. Y.—p. 64.
Pathologic Perforation of Gallbladder. M. C. Rumbaugh, Wilkes-Barre. —p. 65.
Perianal Urinary Fistula. F. S. Mainzer, Clearfield.—p. 66.
Rupture of Liver with Subdiaphragmatic Hemorrhage. G. B. Stull, Harrisburg.—p. 67.
Gangrene of Undescended Testicle from Torsion of Cord. N. P. Davis, Pittsburgh.—p. 68.
Delivery by Laparotomy of Seven Months' Living Child Two Years and Nine Months After Subtotal Hysterectomy and Right Salpingo-Oophorectomy. R. J. Bower, Williamsport.—p. 69.

Public Health Reports, Washington, D. C.

44: 2769-2846 (Nov. 15) 1929

Pellagra-Preventive Action of Canned Salmon. J. Goldberger and G. A. Wheeler.—p. 2769.

Radiology, St. Paul

13: 469-562 (Dec.) 1929

Method for Measuring Lumen of Esophagus. P. M. Hickey, Ann Arbor, Mich.—p. 469.
Diverticulum of Esophagus. P. B. Goodwin, Peoria, Ill.—p. 472.
Treatment of Benign Uterine Hemorrhage by Irradiation. W. C. Danforth, Evanston, Ill.—p. 479.
Roentgenologic Manifestations of Intracranial Disease. J. D. Camp, Rochester, Minn.—p. 484.
*New Lead Preparation for Treatment of Cancer. H. J. Ullmann, Santa Barbara, Calif.—p. 494.
Skin Reactions Following Exposure to Roentgen Rays: I. Comparison of Effect of two Different Wavelengths on Skin of Rats. E. A. Pohle and C. H. Bunting, Madison, Wis.—p. 496.
*Ultraviolet Radiation Therapy in Erysipelas. W. H. Ude, Minneapolis. —p. 504.
Some Unusual Roentgen Findings in Skulls. C. B. Rose, Chicago.—p. 508.
Radiology of Thorax. S. Brown, Cincinnati.—p. 515.
Multiple Tuberculous Arthritis Simulating Malignancy and Charcot Joint: Case. J. L. Harvey and I. V. Hall, Denver.—p. 526.
Osteitis Fibrosa, Monocystic, Polycystic and Diffuse. E. T. Evans, Minneapolis.—p. 530.

New Lead Preparation for Treatment of Cancer.—Ullmann discusses a double phosphate of lead and calcium, $Pb_3(PO_4)_2.Ca_3(PO_4)_2$, which he has used in the treatment of cancer. It is said to be less toxic to the blood than preparations previously used, and at the same time apparently as effective therapeutically. The primary effect is an increase in both the hemoglobin and the red count. In none of the eight patients on whom it has been used was an anemia produced.

Ultraviolet Radiation Therapy in Erysipelas.—Ude advocates the use of ultraviolet radiation in preference to antitoxin in the treatment of erysipelas. Apparently excellent results are secured with a minimum of danger, discomfort and expense to the patient. Some of the advantages of the treatment are that it is readily available in practically all communities; it requires only one treatment; it is devoid of danger; it is inexpensive; the results are comparable to those of any other method. The technic of treatment is simple. It can be carried out with any ultraviolet lamp, and necessitates only a knowledge of the efficiency of the lamp. This form of treatment is applicable to ambulatory patients who can be kept under observation in the home. This effects a saving to the patient as it eliminates hospitalization. The data on ninety-one patients treated by this method are presented.

South Carolina M. Assn. Journal, Greenville

25: 553-576 (Nov.) 1929

Creeping Eruption: Larva Migrans. F. K. Rhodes, Florence.—p. 555.
Reflex Symptoms of Rectal and Colon Diseases. W. E. Applehaus, Louisville, Ky.—p. 556.
Head Injuries. D. L. Maguire, Charleston.—p. 560.
Optic Nerve Atrophy from Remote Causes, Dr. H. V. Wurdemann. J. F. Townsend, Charleston.—p. 566.

West Virginia M. Journal, Charleston

25: 641-704 (Nov.) 1929

General Field of Traumatic Surgery. W. O. Sherman, Pittsburgh.—p. 641.
Nerve and Muscle Injury in Relation to Fractures. A. G. Rutherford, Welch.—p. 645.
Importance of Complete Peritonization in Abdominal Surgery. J. E. Cannaday, Charleston.—p. 653.
Treatment of Endocervicitis. B. C. John, Morgantown.—p. 657.
Diagnosis of Upper Urinary Tract Lesions. W. H. Toulson, Baltimore. —p. 659.
Plea for Closer Cooperation Between General Practitioner and Surgeon in "Acute Abdomen." E. T. W. Hall, Weston.—p. 660.
Relation of Musical Sounds to Physical Diagnosis. F. Howell, Buckhannon.—p. 664.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

2: 839-884 (Nov. 9) 1929

Pathogenesis and Treatment of Asthma. A. F. Hurst.—p. 839.
Cerebrospinal Fluid in Intracranial Inflammation. J. G. Greenfield.—p. 841.
Surgical Tendencies in Modern Midwifery. E. Essen-Möller.—p. 843.
Treatment of Hyperpiesia. A. H. Douthwaite.—p. 844.
Blindness in Old Age. J. J. Evans.—p. 847.
Pain as Guiding Symptom in Injection Treatment of Varicose Veins. G. H. Colt.—p. 848.
Beriberi. A. Cannon.—p. 852.
Aspirating Contents of Stomach. H. Bailey.—p. 854.
Motorist's Heel. A. P. Bertwistle.—p. 855.

Journal of Anatomy, London

64: 1-128 (Oct.) 1929

Growth of Long Bones in Fetal Life as Exemplified by Case of Fetal Syphilis. H. A. Harris.—p. 1.
*Vascular Supply of Bone: Epiphyseal Cartilage. H. A. Harris.—p. 3.
*Histology of Retained Testis in Human Subject at Different Ages and Comparison with Scrotal Testis. E. R. A. Cooper.—p. 5.
Radiologic Investigation of Epiphyses of Long Bones. R. S. Paterson. —p. 28.
Diverticulum of Appendix. T. Walmsley.—p. 47.
*Thyroid Arteries Considered in Relation to Surgical Importance. L. Rogers.—p. 50.
True Congenital Diverticulum of Trachea in Subject Showing Also Right Aortic Arch. E. P. Stibbe.—p. 62.
Valves in Veins. K. J. Franklin.—p. 67.
Development of Inferior Vena Cava in Light of Recent Research: Abnormalities and Current Descriptions of Ascending Lumbar and Azygos Veins. R. J. Gladstone.—p. 70.
Aberrant Accessory Ureter Associated with Hydronephrosis. H. Edwards. —p. 94.
Complete Absence of Quadratus Femoris. E. P. Stibbe.—p. 97.
Bursal Sac in Substance of Subscapularis. E. P. Stibbe.—p. 98.
Comité International Des Recherches Des Parties Molles (Parties Non Osseuses). A. Keith.—p. 99.

Vascular Supply of Bone: Epiphyseal Cartilage.—The older views of the blood supply to the region of the epiphyseal cartilage are confirmed by Harris. Vessels penetrating the epiphyscal cartilage are not seen in the growing animal except in the case of preexisting disease leading to failure of proliferation of the epiphysial cartilage as in acute arrest of growth; in chronic disease of the area as in osteochondritis syphilitica, and in that delay of union of the epiphyses which is sometimes seen at the end of adolescence, rarely in man but more frequently in

certain domesticated and wild animals. In the actively growing healthy animal the epiphyseal cartilage is avascular and presents the typical mode of growth of a vegetative tissue, as seen also in a cancer, fibroid, gumma or tubercle.

Histology of Retained Testis in Human Subject and Comparison with Scrotal Testis.—From a study of the retained testis in childhood at different ages and in different situations, and a comparison with scrotal testes of similar ages, Cooper concludes that the farther the preadolescent testis has descended in its normal route, the more closely does it correspond, histologically, to the scrotal gland of the same age. At whatever position the testis is arrested and at whatever preadolescent age it is examined, the essential elements of the gland, i. e., spermatogonia and undifferentiated cells, are, if not throughout the gland certainly in many parts, identical in position, structure and relationship with those of scrotal testes of the same age. The younger the age at which a retained gland is examined, the more are the normal appearances and characteristics retained. Certain alterations in the imperfectly descended testes occur. Throughout preadolescent life the undifferentiated tubular cells in the retained testis apparently retain their vitality. Many continue to develop into true spermatogonia, while others become cells of Sertoli. In both scrotal and retained testes the undifferentiated cells are similar, and at the same period of life (just before puberty) many undergo further specialization into cells of Sertoli. These are regarded as the nutritive elements of the spermatogenic cells. The retained gland is able to develop in childhood and although in later childhood the tubules appear relatively less numerous than in the scrotal testis of corresponding age, they are collectively in similar numbers, or even more numerous, than at earlier ages, unless the more unfortunate higher degree of retention prevails. The cells of Leydig are apparently not influenced by the abnormal situation of a retained testis. In no cases of retained testes examined was there anything of an abnormal nature in the structure of the epididymis.

Thyroid Arteries Considered in Relation to Surgical Importance.—Evidence is presented by Rogers to the effect that although the superior thyroid is the primitive artery to the thyroid body, the inferior artery is generally the larger and the more important from the point of view of occlusion to reduce the vascularity of goiters. A route for the exposure and trunk ligation of this vessel has been worked out on the cadaver and practiced first in the dissecting room and later in cases of toxic goiter.

Lancet, London

2: 963-1022 (Nov. 9) 1929

Virulence of Micro-Organism in Infective Disease. J. A. Arkwright. —p. 963.
*Use of New Quinoline Derivative in Treatment of Infection. G. Armitage and J. Gordon.—p. 968.
Value of Bismuth in Treatment of Syphilis. H. Ritter and C. L. Karrenberg.—p. 971.
Electrical Treatments in Acute Conditions. C. B. Heald.—p. 974.
Foreign Bodies and Nasal Carriers of Diphtheria. A. H. G. Burton and A. R. Bahnam.—p. 977.
Orbital Abscess Following Removal of Tonsils and Adenoids. G. N. Clark.—p. 978.

Use of New Quinoline Derivative in Treatment of Infection.—A number of derivatives of anil-quinoline have been shown to possess strong antiseptic properties. They represent a new group of compounds, not hitherto used as antiseptics. These substances are crystalline solids which display a characteristic green reflex, and form in water blue and violet solutions. Since the substance is used in high dilution, the stains of its solutions on linen are easily removed by ordinary washing processes. Owing to the instability of these compounds toward hydrochloric and other strong acids, they are unsuitable for administration by the mouth, unless special provision is made for protecting them in their passage through the stomach. The member of the group selected for experiments by Armitage and Gordon was 2(p-dimethylamino anil)6 methyl quinoline methochloride. This compound in 0.02 per cent solution was found to be more potent than acriflavine. In view of the comparatively high antiseptic power and the relatively low toxicity, it was decided to test this compound in the treatment of all varieties of both local and general infective conditions. It has been used as a prophylactic antiseptic dressing or pack in the treatment of potentially infected accidental wounds and abrasions; extensive laceration of soft tissues, either alone or associated with fracture, requiring a thorough toilet of the wounds under general anesthesia; circumcisions, amputation stumps and skin grafts, and in the postrectal space after operation for prolapse or excision of the rectum or after interstitial irradiation of cancer of the rectum with radium. It has been used as a local application and pack in the treatment of acute infections of the skin and subcutaneous tissues—i. e., boils, carbuncles and cellulitis; suppurative hematomas; acute suppurative bursitis and lymphadenitis; ischiorectal and perianal abscesses; infected abdominal wall wounds—e. g., after operation for acute perforated appendicitis—and fungating growths. As an irrigant it has been effective in the treatment of acute infections of bones and joints, such as acute infective osteomyelitis and acute suppurative arthritis; in the treatment of chronic long standing infections, comprising chronic infective osteomyelitis of the lower jaw, chronic empyemas and suppurating hydatid cyst of the liver, and after marsupialization. As a genito-urinary irrigant it is used in cases of acute and chronic cystitis; suprapubic bladder washing after cystotomy for enlarged prostate, vesical calculus, ruptured bladder and urethra, or malignant papilloma of the bladder treated by diathermy; external urethrotomy; perineal section for extravasation of urine, and nephrostomy for pyonephrosis. It may be given intravenously in cases of septicemia showing a positive blood culture. The strength of the solutions used varied from 0.05 to 0.1 per cent in physiologic solution of sodium chloride. The action of this antiseptic is only slightly diminished by the presence of serum, and the substance has a relatively high antiseptic titer, together with a low toxicity. The clinical results indicate that this is an antiseptic which is valuable in the treatment of all classes of surgical infections.

Japanese J. Gastroenterology, Kyoto

1: 147-198 (Oct.) 1929

Esophageal Reflex Movements: II. Promotion and Restraining of Esophageal Reflex Movements. N. Midzuta.—p. 147.
Contribution to Knowledge of Velocity of Hijmans van den Bergh's Reaction. T. Maeda and T. Morishima.—p. 155.
Ferment Action and Ion Concentration on Destruction of Amylase by Acids. T. Tomioka.—p. 158.
*Significance of Pigments in Treatment of Infection of Biliary Ducts. C. Takahashi.—p. 169.

Significance of Pigments in Treatment of Infection of Biliary Ducts.—By examining the bactericidal power of 121 species of organic pigments, of which seventy-three were acid and forty-eight alkaline in reaction, in the presence of ox bile, Takahashi obtained twenty-eight pigments which kill a certain quantity of typhoid bacilli within twenty-four hours when diluted more than 200 times. The pigments which show the bactericidal power in the presence of bile are mostly alkaline. Mercurochrome-220 soluble is the only exception, and though it is of acid reaction, its bactericidal power against the typhoid bacillus is exceedingly strong. By examining the bactericidal power of pigments in various solvents, Takahashi found it is weakest in a solution in the bile, no matter whether the reaction of those pigments is acid or alkaline. The bactericidal power of pigments is not constant, as the bile employed as solvent differs. If the bile is the same kind, the higher the concentration of the bile, the weaker becomes the bactericidal power of pigments. The bactericidal power of pigments is much weakened when they are injected into the veins and excreted by the liver. A large number of pigments have been discovered which are excreted by the liver in large quantities, even when injected into the veins of a rabbit in less than lethal doses, and which yet maintain sufficient power to kill the typhoid bacillus. Particularly it was demonstrated that mercurochrome-220 soluble and trypaflavine have bactericidal power against typhoid bacilli, even in human experiments and even after having passed through the liver. It was verified by human experiments that when injected into the veins and excreted by the liver, the pigments flow out with the bile into the gallbladder, in which they are reservoired and concentrated, and thus their bactericidal power against the typhoid bacillus is much strengthened. In the experiments in the human body, if the same pigment is repeatedly injected into the body, the pigment excreting function of the liver with regard to that pigment appears to be affected.

Paris Médical

2: 309-324 (Oct. 12) 1929

Exophthalmic Goiter: Oculopalpebral Syndrome. P. Sainton.—p. 309.
*Changes in Blood After Intravenous Injection of Oxygen. Alexandresco-Dersca and V. Valter.—p. 314.
Syndromes of Deminer..ization and Their Treatment. E. Dehaussy.—p. 318.

Changes in Blood After Intravenous Injection of Oxygen.—Alexandresco-Dersca and Valter state that as oxygen is a constituent of the blood it is rapidly and entirely absorbed if injected slowly and does not cause the formation of an air embolus. They used the apparatus of Bayeux, by means of which from 1 to 3 liters of oxygen was introduced into the veins at a rate of from 8 to 9 cc. a minute. Subcutaneously up to 3,000 cc. has been given by repeated injection within twenty-four hours. By inhalation from two to three tanks of oxygen was given. Blood examinations were made in twenty patients with the following results: the introduction of oxygen into the veins of patients with polyglobulism masked by hydremia caused a considerable decrease in the number of red blood corpuscles even up to one million without, however, causing a change in their normal oxygen content, as the coefficient of refraction remained the same. The hemoglobin content also decreased considerably after the administration of oxygen. In asystolic patients showing polynucleosis without deviation to the right, oxygen therapy caused a decrease in the number of leukocytes. These changes were always seen after intravenous injection, were less marked after subcutaneous injection, and were never noted after the inhalation of oxygen. This may be due to changes in the lungs which prevent full utilization of the oxygen. The feeling of well being was increased to such an extent, although only transitorily, that the patients demanded repetition of the treatment, in spite of the pain attending the intravenous injections. The respiration became deeper and slower and the pulse rate was slowed; the strength of the pulse, however, was not decreased. Alexandresco-Dersca and Valter consider oxygen therapy a valuable addition in the treatment of patients with insufficient hematosis.

Presse Médicale, Paris

37: 1325-1340 (Oct. 12) 1929

Traumatic Parkinsonism: Two Cases. O. Crouzon and L. Justin-Besançon.—p. 1325.
*Hemorrhoids: Sclerosing Treatment in One Sitting. V. Bellot.—p. 1328.
Erythremia and Arteritis Obliterans. P. Stricker and P. Bicart.—p. 1331.

Hemorrhoids: Sclerosing Treatment in One Sitting.—Bellot reports his experiences with the quinine and urethane method of treatment, which he has used with success in more than 250 patients. He makes interstitial injections, by means of a graduated glass syringe with a short thin needle, of a solution containing quinine and urethane. After the usual preparation of the patient, the anal region is disinfected with a dilute solution of iodine, so as not to cause any injury to the mucous membrane. After it is dry, cupping is done with the ordinary cupping glass to exteriorize any internal hemorrhoids. Then the quinine and urethane injections are made into the hemorrhoids; Bellot also injects those which appear cured and sclerotic but which may still be active. To prevent recurrence it is also important to sclerose tissue which had previously appeared normal but in which after cupping a bluish discoloration was seen. Bellot administers from 25 to 75 mg. of extract of opium to maintain constipation for four days. After this time, stools may be allowed to pass. Bellot states that rapid action is essential in giving the treatment, with care not to retrace the steps on giving the injections. His results were as successful in prolapse and in aged persons as in younger ones.

37: 1341-1356 (Oct. 16) 1929

*Tuberculosis of Lung and of Bronchial Lymph Nodes: Site of Primary Lesion. A. Giraud.—p. 1341.

Pulmonary Tuberculosis and Tuberculosis of Bronchial Lymph Nodes: Site of Primary Lesion.—On the basis of a review of the literature and his personal experience, Giraud states that, although certain areas of predilection exist, tuberculosis can arise in any part of the lung and the search for the primary focus should therefore be made without regard to preconceived ideas of its location. He stresses the importance of the interrelation of anatomic and roentgenologic control. In certain instances, roentgenographic evidence points to the frequency of apparent lesions located in the space between the clavicles and the bronchial hilum or just below the clavicles. The apexes, on the other hand, seem more often the site of stationary lesions which, as a rule, are only old scars.

Revue Française de Gynécologie et d'Obst., Paris

24: 529-592 (Sept.) 1929

Plastic Modifications of Uterus in Presence of Tumors of Ovaries. O. Beuttner.—p. 529.
*Hypophyseal Extracts: Comparative Value of Various Preparations: Active Principles: Accidents. F. Chatillon.—p. 535.
Experience with Technic of Hysterectomy According to Beuttner. R. d'Ernst.—p. 547.
*Pregnancy in Fimbriated End of Uterine Tube: Case. M. Mollow.—p. 559.
Surgical Treatment of Peritoneal Lesions Due to Tubal Pregnancy. G. Nordmann.—p. 565.

Hypophyseal Extracts: Comparative Value of Various Preparations.—Chatillon points to the importance of adhering to a uniform international standardization in view of the varying clinical and chemical results reported with the use of the different preparations. He discusses the relative action and dosage of several of these. The incidence of ruptures of the uterus may be ascribed in certain cases to the administration of the extract in spite of definite contraindications. On the basis of his experience over a period of twenty years at Beuttner's clinic, Chatillon advises the use of an extract from which the active principle of hypertension has been removed. As a further guide for the administration, he considers it essential to be assured that the passage is free for the fetus. The dilatation should be complete with the head in a normal position. The soft parts should not present any sign of rigidity. With observance of these precautions, the injection of hypophyseal extract, according to Chatillon, is without danger.

Pregnancy in Fimbriated End of Uterine Tube: Case.—Mollow's patient, a woman, aged 30, developed severe pain in the iliac fossa on the right side, two months after the last menstruation. During the past three weeks she had had a slight but constant discharge of blood. She had been married for twelve years and had had two deliveries, one of which had been premature. She had also had six abortions, none of which, however, had pathologic consequences. Vaginal examination showed the cervix to be typical of a multipara; it was irregular, was deviated toward the right side, was soft and nonresistant and was very sensitive on digital examination. The uterus was in anteflexion and of the size of a pregnancy of two months. In the right iliac fossa there was a tumor, which was tender and very painful on palpation. Two days later, severe pain occurred, which radiated over the entire slightly distended abdomen. As the pulse was 120 with a normal temperature, immediate laparotomy was done. When the abdominal cavity was opened, the pelvis was seen to be filled with blood. The uterus was in anteflexion, somewhat enlarged, nonadherent, soft and slightly deviated toward the right side. The right tube was lengthened and tortuous and reached into the pouch of Douglas; it was surmounted at the end by a small tumor. Left-sided salpingectomy together with resection of the right tube for sterilization was done. There was no etiologic reason for the fixation of the fertilized ovum on the infundibulum. Anomalies were not evident in the genital tract either macroscopically or in the microscopic sections. As the ovum had developed in the muscular and connective tissue of the wall of the tube, this case may be classed as either an infundibular or a primary peritoneal pregnancy.

Revue Médicale de la Suisse Romande, Lausanne

49: 665-728 (Sept. 25) 1929

Acute Anterior Poliomyelitis: Epidemic in Fribourg Canton. H. Perrier.—p. 665.
Cranioplasty. C. Cornioley.—p. 677.
*Acromegalic Diabetes: Case. E. Martin.—p. 693.

Acromegalic Diabetes: Case.—In Martin's patient, a woman, aged 52, symptoms of acromegaly had developed after operation for an adenomatous goiter eight years previously. Roentgen examination had revealed that the sella turcica was enlarged. Bitemporal hemianopia persisted, which was slightly improved for a short time, after treatment with roentgen rays. Bilateral trepanation again caused temporary relief of the

compression. However, it was not until hypophysectomy, done by way of the nasal route, three years after removal of the goiter that normal vision was restored and a decrease in the size of the hands and feet was observed, together with a return of menstruation. Microscopic examination showed that the excised fragments were from an adenoma with eosinophilic cells of the hypophysis. The patient was in good condition for the next three years. After that time a small lesion appeared on her lip. As the result of a blood test was doubtful, neoarsphenamine was given, which was, however, tolerated poorly. A few months later polydipsia and polyuria, coincident with loss of weight, occurred together with glycemia and glycosuria and acetone and diacetic acid present in the urine. By the administration of insulin in large doses and strict adherance to appropriate diet, the diabetes was controlled. There was no sign of enlargement of the hypophysis or a recurrence of the tumor. On the basis of this observation and a review of the literature, Martin concludes that there is a relation of the nervous system and the glands of internal secretion, especially the thyroid, hypophysis and suprarenals, to carbohydrate metabolism. Acromegalic diabetes may be explained by the neurocrine influence of hyperfunction of the hypophysis, together with modifications of the pancreatic secretion. This neurocrine secretion is of great interest, as it demonstrates the histophysiologic relation between a gland of internal secretion and the sympathetic nervous system. The incidence of pluriglandular diabetes may furthermore be accepted as a guide for the understanding of the case described.

Policlinico, Rome

38: 1539-1578 (Oct. 28) 1929. Practical Section

Serous Meningitis in Children. A. Fiorentini.—p. 1539.
*Postoperative Peptic Ulcer with Diverticulum. G. Zingarelli.—p. 1547.
Simple Ulcer of Cecum. G. Bombi.—p. 1550.
Occupational Mercurial Poisoning in Relation to Tuberculosis. R. Schemitz.—p. 1554.

Postoperative Peptic Ulcer with Diverticulum.—Zingarelli reports a case of postoperative peptic ulcer with a large diverticulum that had formed between the afferent and efferent loops of an old gastro-enterostomy. The author presents two roentgenograms, one taken before and the other after the second operation. As he found at operation no particular mechanical peculiarities to which he might attribute the genesis of the diverticulum, the author thinks that it may have been due to the peculiarities of the gastro-entero-anastomosis lower down, applied to the greater curvature. The roentgenogram taken a month after the operation showed perfect gastric evacuation through the new anastomotic route.

Riforma Medica, Naples

45: 1303-1335 (Sept. 28) 1929

*Influence of Intoxication of Liver on Chemical Composition of Bile. G. Bossa.—p. 1303.
Gunshot Wound with Retention of Projectile in Cranial Cavity. M. M. Reggiani.—p. 1305.
Presence of Spirochetes in Blood of Ill and Healthy Subjects. E. Balbi and A. Chinaglia.—p. 1311.
Calculosis of Ureters. F. Fedeli.—p. 1315.

Influence of Intoxication of Liver on Chemical Composition of Bile.—Bossa chose dogs for his experiments. The bile was collected through a fistulous opening made at the base of the gallbladder. Of each sample of bile collected, Bossa determined the quantity, the specific weight, the water content, the amount of dry substance, and the content of mineral salts, mucin, bilirubin, urobilin, bile salts and cholesterol. After having made a considerable number of determinations on the bile of each normal dog, he began the application of heterogenous protein to provoke intoxication of the liver. From the examination of the results obtained, it appeared clear that chronic protein intoxication has a marked influence on the chemical composition of the bile. This influence is manifested in an evident manner on the amount of bile salts, the bile pigments and the mucin content of the bile, and to a less extent, though constant, on the cholesterol content. The diminution of the bile salts and the increase of mucin that Bossa observed in his experiments are perfectly analogous to what D'Amato noted in his experiments on intoxication of the liver. He agrees with D'Amato that the modifications of the bile produced by intoxication of the liver are opportune conditions for the precipitation of cholesterol and the formation of biliary calculi. Disturbances of metabolism, infectious diseases, and slow and continued absorption of pathologic products may be due to heterogenous proteins.

Deutsches Archiv für klinische Medizin, Leipzig

165: 129-256 (Oct.) 1929

Clinical Aspects of Joint Effusions. E. Risak and W. Winkler.—p. 129.
*Hypohidrotic Action of Atropine. E. Jürgensen.—p. 165.
*Mechanism of Modern Fever Therapy. J. Vonkennel.—p. 180.
*Origin of Phosphates in Pure Gastric Juice. K. Hoesch.—p. 201.
Enzyme Content of Blood in Health. F. Delhougne.—p. 213.
Microdetermination of Rest Carbon of Blood in Diabetes. W. Stepp and J. Sauer.—p. 223.
Effect of Insulin on Rest Carbon of Blood in Diabetes. W. Stepp and J. Sauer.—p. 232.
Colloidosmotic Pressure of Blood Serum During Insulin Treatment in Severe Diabetes. E. Kylin.—p. 235.
*Action of Potassium Iodide in High Blood Pressure. L. Friedmann, E. Buch and J. Deichsel.—p. 243.
Percussion and Auscultation. R. Cobet.—p. 245.
Transient Dextrosuria Without Increase in Sugar Content of Blood in Coal Gas Poisoning. K. E. Greinacher.—p. 247.

Mechanism of Hypohidrotic Action of Atropine.—Jürgensen presents evidence in support of his contention that the hypohidrotic effect of atropine is the result of the action of the drug not on the nerve endings in the sweat glands but on the cells of the glands.

Mechanism of Modern Fever Therapy.—Vonkennel states that in malaria therapy the normal vesiculation time of eleven or twelve hours (the time elapsing between the application of a cantharides plaster to the thigh and the appearance of vesicles) is reduced during the height of an attack of fever to five or four hours. Following the crisis, the vesiculation time increases to five or six hours and in the fever-free interval it remains at from six to seven hours. On the basis of these facts the author concludes that the increased permeability of the cells of the human organism is an important factor in the action of modern fever therapy.

Origin of Phosphates in Pure Gastric Juice.—By means of a retention stomach tube, Hoesch demonstrated that the phosphates in the gastric contents do not necessarily originate from the food; they are present in pure gastric juice and in the secretion that appears following the ingestion of alcohol and of coffee or the injection of histamine. Even in pathologic conditions of the stomach (gastritis, ulcer, achylia and cancer) phosphates are secreted by the stomach. On the basis of his observations the author concludes that the cells of the glands of the stomach secrete phosphoric acid and that the largest part of the phosphates does not, as Tabora maintains, originate in the food. The secretion of phosphoric acid is least marked when the reaction of the gastric juice is acid and most marked when it is neutral or alkaline.

Action of Potassium Iodide in High Blood Pressure.—To determine whether or not potassium iodide in therapeutic doses modifies the circulation in patients with diseases of the blood vessels, Friedmann et al. administered potassium iodide to a large number of patients with high blood pressure and then took blood pressure readings every ten or twenty minutes. The potassium iodide was administered perorally, usually in a dose of 5 cc. of a 2.5 per cent solution of potassium iodide. Most of the patients were women aged from 40 to 70, with blood pressure values between 160 and 260 mm. of mercury; they presented the characteristic symptoms of high blood pressure. The study was continued for a period of eleven months. Altogether twenty-five patients were given potassium iodide fifty-two times and 120 series of blood pressure readings were taken. Of fifty-two curves, twenty did not show an appreciable modification of the blood pressure. Fourteen times, usually immediately following the administration of the potassium iodide, there occurred a sudden rise in the blood pressure, varying from 30 to 40 mm. of mercury. In eighteen experiments a moderate, strikingly uniform drop in the blood pressure was demonstrated. The drop began about one-half hour following the administration of potassium iodide and in one hour amounted to from 10 to 25 mm.; then, after a short interval, the blood pressure began to rise, remaining, however, for a long time under the original value. The characteristic decrease in the blood pressure was noted as a rule in patients with moderate

hypertension (original values of from 170 to 190 mm. of mercury) and with normal urine. The increases of blood pressure were noted, on the contrary, in patients with symptoms of kidney disease.

Deutsche medizinische Wochenschrift, Berlin

55: 1701-1740 (Oct. 11) 1929

*Experiences with Liver Therapy in Pernicious Anemia: Causes of Failures and Fatalities. V. Schilling.—p. 1701.
*Possibilities and Limitations of Liver Therapy. R. Seyderhelm.—p. 1704.
Relation Between Parodontitis and Neuritis. J. Simson.—p. 1706.
Increased Incidence of Bronchial Cancers During Last Decade: Diagnostic Significance of Bronchography. M. Lipschitz.—p. 1708.
Diagnostic Value of Diastase Determinations in Pancreatitis. H. L. Popper.—p. 1712.
Value of Roentgenoscopy in Differential Diagnosis of Acute, Surgical, Abdominal Diseases. A. Dzialoszynski.—p. 1713.
Nonspecific Bone Formation After Infectious Diseases. H. Simon.—p. 1714.
Ether Carbon Dioxide Anesthesia According to Ombrédanne's Method. W. O. Klein.—p. 1716.
Treatment of Postpartum Eclampsia. R. Kobes.—p. 1719.
Orchitis Parotidea Effecting Temporary Changes Similar to Those Following Steinach's Operation. J. H. Schultz.—p. 1720.
Dental Amalgam as Cause of Mercury Dermatitis. F. Blumenthal and K. Jaffé.—p. 1720.
Gummatous Syphilis of Lung. A. Fischer.—p. 1721.
Dermatitis Caused by Pastinacea Sativa. R. G. H. Heye.—p. 1722.
Prophylaxis of Anemia in Premature Infants. H. Netter.—p. 1722.
Occupational Therapy of Patients with Venereal Diseases During Their Stay at Hospital. C. Stern.—p. 1722.

Experiences with Liver Therapy in Pernicious Anemia.—Schilling reports observations on eighty patients with pernicious anemia, who had received liver therapy. Fifty of these patients showed relative recovery, that is, the number of erythrocytes exceeded 4 million and in many even 4½ million. Most of the other patients showed marked improvement. In five persons the treatment did not prove successful. However, in four of these the therapy had been only of short duration. Fourteen of the eighty patients were persons who had formerly received liver treatment but who had suffered relapses. In all of these patients in whom the pernicious anemia was not complicated by other diseases, the repeated treatment gave the same good results as during the first period. The case histories of the six patients who died are reported in detail. All of them were elderly persons and the pernicious anemia was complicated by other diseases. The postmortem examinations revealed that in these cases the anemia was not of the same severity as in patients who died of pernicious anemia and who had not undergone liver therapy. Only in one instance did the anemic symptoms become more severe in spite of the liver therapy. However, in this instance the patient was asthenic and suffered from menorrhagia. Liver extracts often did not bring the desired results, and fresh liver was used instead and proved more effective. The author comes to the conclusion that liver is of great value in the treatment of pernicious anemia. Failures and fatalities are generally caused either by a faulty technic in treatment or by complicating diseases.

Possibilities and Limitations of Liver Therapy.—Seyderhelm points out that in the majority of cases liver therapy counteracts the changes in the blood which are characteristic of pernicious anemia. Failure to attain this result was usually due to one of the following factors: 1. The quantities of liver were not sufficient. 2. Complications existed. 3. Toxic disturbances of the central nervous system became manifest. 4. Intercurrent diseases, such as sepsis, pyelitis or pneumonia, developed. The author further discusses the use of fresh liver and the value of various liver extracts. He then directs attention to the fact that although liver therapy counteracts the changes in the blood it does not influence the other symptoms such as the achylia gastrica and the funicular myelitis. He considers liver treatment an organic therapy which supplies the hormone that is normally secreted by the liver and which influences the formation of the blood. However, the injurious effects that pernicious anemia has on other organs are not influenced by liver therapy. Consequently, the administration of liver is not a causal but a symptomatic form of treatment, which counteracts only one symptom of the disease. The author asserts that the funicular myelitis remains unaffected by the liver therapy and it is probable that, since liver therapy by improving the condition of the blood prevents many fatalities, these disturbances of the central nervous system become manifest in a larger number of cases. Thus the clinical aspects of pernicious anemia change and the disease acquires more the character of a pernicious myelo-encephalic toxicosis. Hallucinations and disturbances of speech become manifest, and sometimes a patient falls into a condition of coma with Kussmaul's respiration. It has also been noted that patients with progressive funicular myelitis develop cystopyelitic and septic processes.

Deutsche Zeitschrift für Chirurgie, Leipzig

219: 1-379 (Sept.) 1929. Partial Index

*Cancer of Rectum: Extirpation by Way of the Sacrum: One Thousand Cases. F. Mandl.—p. 3.
*Status of Complete Exclusion of Intestine in Modern Surgery of Intestine. H. Finsterer.—p. 41.
*Protection of Gastro-Intestinal Sutures by Means of Drains and Gauze Strips. F. Mandl.—p. 107.
*Blood Changes Following Splenectomy: Clinical Significance. H. Kulka.—p. 119.
*Symptoms and Treatment of Idiopathic Varicocele. E. Ebner.—p. 148.
*Study of Local Anesthesia in Cases of Cervical Phlegmons and Septic Diseases in General. R. Waldapfel.—p. 179.
*Treatment of Brain Injuries in Children. H. Steindl.—p. 221.
*Humerus: Epicondylar Pain of Traumatic Origin. W. Brandesky.—p. 246.
*Inhalation of Carbon Dioxide Especially in Injuries of Respiratory Center and to Combat Operative Shock. K. Doppler.—p. 308.
*Chronic Peptic Ulcer Developing on Benign Tumor of Stomach. H. Lorenz.—p. 328.
*Multiple Tumors of Intestine: Lymphosarcoma and Carcinoma. W. Kreibig.—p. 334.

Cancer of Rectum.—Mandl relates his experiences with 461 extirpations of a cancer of the rectum by the sacral route. A favorable permanent result was obtained in 33.6 per cent. Excluding the deaths, the result after four years was 40 per cent living. In 29 per cent of all cases in the series no further information was obtainable. Including previously reported cases, favorable results after five years are reported in 30 per cent. The details of the operation are discussed and the fact is emphasized that local excision must be extensive and sweeping, as recurrence in the majority of cases is local and not in any sense metastatic.

Complete Intestinal Exclusion.—A large clinical experience has convinced Finsterer that complete exclusion of the intestine is preferable to partial exclusion by means of an entero-anastomosis. The operation is not a dangerous one. In the treatment of fecal fistula it is the method of choice. In cases of tuberculosis of the cecum it leads to rapid results. In carcinoma of the colon it is the preferable first stage of operation, the second stage including resection of the tumor. In cases of carcinoma of the rectum or any portion of the intestinal tract in which because of metastases to the liver radical operation cannot be performed, entero-anastomosis should be done, but in inoperable cases accompanied by suppuration, complete exclusion is to be preferred. Suturing both ends of the intestine into the abdominal wall is the most effective and the best method, even in the presence of a fecal fistula.

Use of Drains and Gauze Strips in Gastric Surgery.—Experimental work and clinical observation have convinced Mandl that the placement of drains and gauze strips in gastro-intestinal surgery, even when in close proximity to the suture line, does not lead to dehiscence, although healing of the wound may be prolonged somewhat. Peritonitis does not result but a localized abscess may form. Drains should be removed very carefully and not too soon.

Effect of Splenectomy on Blood.—Kulka asserts that splenectomy does not cause any change in the blood picture. Erythrocytes containing Jolly bodies are found only occasionally and not at all after two years. The osmotic resistance of the erythrocytes to hypotonic salt solutions is increased after the first week, but after two years it is again normal. There is no change in the coagulation time. Immediately after the splenectomy a leukocytosis is present. Up to the fourth week it is neutrophilic in character; thereafter it is a relative lymphocytosis. Eosinophilia appears some time during the second month and, together with the lymphocytosis, is present even ten years after operation. Monocytosis was not noted. Six months after the splenectomy the epinephrine reaction was negative; two years later the patient reacted normally. Swelling of lymph nodes was absent in the whole series studied. Removal of healthy spleens, experimentally, does not interfere

with bodily function. It is assumed that the resting portions of the reticulo-endothelial system assumed a vicarious function.

Surgical Treatment of Varicocele.—Ebner deplores radical operation in cases of varicocele in which complications are absent. He reviews the anatomy and physiology of the venous circulation of the scrotum and testis and points out that radical operation is bad for the testis. In uncomplicated cases resection of the scrotum, in severe cases resection of the plexus together with resection of the scrotum according to a method described by the author, is said to be indicated.

Local Anesthesia in Septic Cases.—Waldapfel reports three deaths in cases of cervical phlegmon in which operation was performed under local anesthesia, 1 per cent procaine solution with one drop of epinephrine solution, 1:1,000, added to each 10 cc. of solution. He determined experimentally that the usual lethal dose of procaine is rendered innocuous by the addition of epinephrine; that hyperemia and inflammation are not contraindications to the use of this anesthetic, but that sepsis and nonlocalized suppurations present grave dangers for this form of anesthesia.

Treatment of Brain Injuries.—Steindl endorses the tampon treatment of all open injuries of the brain, even in children. Cases are cited.

Epicondylar Pain.—Brandesky protests against the promiscuous use of the term epicondylitis. He prefers the term epicondylar pain but would restrict its use to those cases in which there is present an injury to the periosteal attachment of a muscle at the condyles, the result of an acute or chronic trauma and often demonstrable by the roentgen ray. The pain may be of long duration but eventual cure always results. Conservative treatment is indicated, especially the use of diathermy.

Value of Carbon Dioxide Inhalations in Surgery.—Doppler endorses this procedure very highly but does not go so far as Henderson, who stated that the anesthetist who does not give such inhalations is like the surgeon who operates only with his hands. He advises surgeons to familiarize themselves with the procedure and to use it whenever it is needed.

Development of Peptic Ulcer on Surface of Benign Tumor.—Lorenz reports a case of very severe melena, evidently the result of a bleeding ulcer, in which a diagnosis of benign tumor at the cardia was made. It was also presumed that a peptic ulcer had developed in the mucous membrane overlying the tumor. This diagnosis was confirmed when the tumor was removed. The mucosa was thin and pale. The author is convinced that vascular stasis must be regarded as being a potent etiologic factor in the development of all peptic ulcers.

Multiple Tumors of Intestine.—In Kreibig's case a lymphosarcoma developed next to a carcinoma of the ileocecal region. He assumes that this region is especially prone to tumor formation; that there is a special blastoma predisposition. The tumors were removed together with lymph node metastases. One year after the operation, the patient had gained in weight and was symptom-free.

220: 1-178 (Sept.) 1929

Surgical Treatment of Malformations of Foot. E. Lexer.—p. 7.
*Pathology and Surgery of Peptic Ulcer of Gastro-Intestinal Tract. H. Bürkle-de la Camp.—p. 31.
*Treatment of Abscess of Lung by Plugging. O. Wustmann.—p. 89.
*Treatment of Inoperable Tumors by Electrocoagulation. H. von Seemen.—p. 109.
Anesthesia of Rectum. W. Schulze.—p. 121.
Tuberculous Osteomyelitis. P. Drevermann.—p. 166.
Treatment of Fractures of Ankle. H. Lätzeler.—p. 170.
Fractures of Upper Extremity of Radius. J. Fessler.—p. 174.

Peptic Ulcer of Gastro-Intestinal Tract.—By means of subcutaneous injections of histamine, in doses which do not cause vessel spasm or contraction of the musculature, Bürkle-de la Camp was able to produce a flow of gastric juice that produced in the prestomach of the rat injuries which passed through all the phases of erosion and acute and chronic peptic ulcers. They appeared even after division of both vagi. They are regarded as being the result of the erosive effect of the gastric juice. Experimental injuries of the gastric mucosa exhibited poor tendency to healing when this gastric juice came in contact with them and went on to the stage of ulcer. Observation of ulcer in the human being led the author to conclude that the process is similar to that observed in experimental animals. Peptic ulcer is not a local but a general disease. Surgical treatment must include removal of the portion of the stomach containing the pyloric glands from which comes the gastric juice which takes part in the second phase of gastric digestion. The Billroth I and II procedure, with complete removal of the antrum, is preferable to gastro-entero-anastomosis. Exclusion of the pylorus is contraindicated. Resection of the antrum should be done even in cases of perforation of the ulcer, but no surgical treatment should be attempted in any case until it is shown definitely that medical treatment has failed.

Treatment of Abscess of Lung.—Wustmann reports cases illustrating the value of plugging evacuated abscess cavities in the lung with a plombe (plug) consisting of a rubber sponge or tissue flaps containing muscle even in cases in which there is associated a disease of the heart or of the blood vessels.

Electrocoagulation Treatment of Inoperable New Growths.—Although there are slight objections to the use of this method of treatment in these cases, von Seemen is convinced that the advantages greatly exceed the disadvantages. There is but little hemorrhage, and only slight shock; sterilization is effected; blood and lymph vessels are occluded; the formation of granulation tissue is favored; the patient recovers rapidly from the effects of the operation; there is only slight pain, and the psychic effect is good.

Klinische Wochenschrift, Berlin

8: 1937-1984 (Oct. 15) 1929

Development of Paired Extremities in Vertebrates: Significance of Mesoderm and Ectoderm. O. Mangold.—p. 1937.
*Experiences with Gerson's Diet in Treatment of Pulmonary Tuberculosis. E. Schwalm.—p. 1941.
*Functional Tests of Islands of Langerhans in Patients with Diabetes: Examination of Capillary and Venous Blood After Sugar Tolerance Test and After Insulin Injection. F. Depisch and Hasenöhrl.—p. 1943.
Relation Between Menstrual Cycle and Ovulation. M. A. van Herwerden.—p. 1948.
Mechanism of Action of Perorally Administered Paraffin Preparations in Constipation. S. Loewe.—p. 1950.
Oligodynamics: A Metal Ion Action. N. Leitner.—p. 1952.
Dermatotropic Character of Dermatophytes. E. Kadisch.—p. 1956.
Peptidase Metabolism in Acute Necrosis of Pancreas. K. Boshamer.—p. 1957.
Citochol Extracts in Serodiagnosis of Cerebrospinal Fluid. H. Sachs and E. Witebsky.—p. 1958.
Biology and Staining of Spirochaeta Pallida. H. Mühlpfordt.—p. 1958.
Idem. S. Bergel.—p. 1959.
Experiments with Old Cultures of Bacillus Hepatodystrophicans. M. H. Kuczynski, B. Hohenadel and E. MacClure.—p. 1960.
Transmission of Virus of Yellow Fever: Experiments on South American Monkeys. M. H. Kuczynski, B. Hohenadel and E. MacClure.—p. 1961.
Clinical Aspects and Treatment of Hemorrhagic Aleukia. A. Chassel.—p. 1962.
Roentgen Therapy in Menopausal Disturbances. J. Borak.—p. 1964.
Types of Mycosis Cutis: Their Dissemination and Means of Combating Them. A. Alexander.—p. 1965. C'en.

Experiences with Gerson's Diet in Treatment of Pulmonary Tuberculosis.—Schwalm applied Gerson's dietary treatment in twenty patients with pulmonary tuberculosis. Several of them increased in weight. However, the gain in weight did not exceed the gain that is noted with the customary diet in institutions for tuberculous patients. Moreover, only those persons showed an increase in weight who received cod liver oil in addition to the diet. Percussion, auscultation and roentgen examination of all patients proved that Gerson's diet did not have a favorable influence on the pulmonary process. The sedimentation speed and the blood picture likewise did not show improvement.

Functional Tests of Islands of Langerhans in Patients with Diabetes.—Depisch and Hasenöhrl report the results of investigations on the capillary and the venous blood of diabetic patients. The results of their tests are thus summed up: 1. After the sugar tolerance test, the tension between the sugar content of the capillary and of the venous blood is lower in the diabetic patient than in the normal person. In only three diabetic patients was the tension equal to that in normal persons. 2. In a young person with diabetes, repeated tests showed a resistance against insulin and a normal tension whenever the patient received a diet rich in fats. However, when his diet

was deficient in fats he showed good sensitivity toward insulin and also the reduced tension of the average diabetic patient. 3. The insulin test with simultaneous determination of the sugar content in the venous and in the capillary blood is valuable for the diagnosis of isolated disturbances of the counter regulation in the liver or in the tissues. 4. The insulin test aids the differentiation between hepatogenic resistance and tissue resistance against insulin. 5. A comparison of the results of the sugar tolerance test with those of the insulin test is recommended for the functional examination of the carbohydrate metabolism.

Medizinische Klinik, Berlin

25: 1571-1610 (Oct. 11) 1929

Disturbances of Pancreas an Indication for Early Operation in Diseases of Biliary Tract. H. von Haberer.—p. 1571.
Experimental Studies on Action of New Medicaments for Circulatory Insufficiency. P. Trendelenburg.—p. 1573.
Modern Dietary Treatments in Private Practice and in Institutions. L. Kuttner and D. Kwilecki.—p. 1576.
*Necessity and Means of Protection of Parenchyma in Diseases of Liver. Umber.—p. 1578.
Dolichosigmoid: Its Significance in Pathogenesis of Intestinal Diseases. H. Strauss.—p. 1579.
*Edema with Anuria and Death from Uremia Without Nephritis. O. Klein and W. Nonnenbruch.—p. 1583.
Chromoscopic Investigations on Diphasic Action of Sympathicotropic Drugs on Secretion of Gastric Juice. P. Mahler.—p. 1585.
*Temporary Mental Disturbances Caused by Liver Therapy in Pernicious Anemia. H. Taterka and C. H. Goldmann.—p. 1586.
*Therapeutic Value of Ultraviolet Rays in Treatment of Gallstones. A. Lorand.—p. 1587.
Roentgenoscopy of Head of Mummy: Studies on Methods of Conservation and on Racial Characteristics of Egyptian Mummies. A. Tschermak.—p. 1588.
Pathogenesis, Symptomatology, Therapy and Prophylaxis of Acute Rhinitis. L. B. Seiferth.—p. 1590. C'td.
Silent Gastric and Duodenal Ulcers. S. Plaschkes.—p. 1591.

Necessity and Means of Protection of Parenchyma in Diseases of Liver.—Umber found that the liver of patients with acute or subacute atrophy of the liver is deficient in glycogen. Atrophy of the liver may be caused by poisons such as arsenic, antimony, lead, dinitrotoluene, chloroform, hydrocyanic acid, mushroom poison and alcohol and also by the toxins of pregnancy and by various bacterial infections. Glycogen protects the liver cell and if it is not present in sufficient quantities ferments will cause a disintegration. The indications that disintegrative forces are active in the parenchyma of the liver are an increased quantity of amino-acids excreted in the urine, a reduced surface tension in the serum and in the urine and a peculiar aromatic odor of the breath. The fact that deficiency in glycogen is the main factor in the pathogenesis of atrophy of the liver makes it necessary to protect the parenchyma by intravenous injections of levulose. Levulose is the carbohydrate that is most readily absorbed by the liver. Insulin promotes the fixation of glycogen in the liver. Consequently the author recommends the administration of both levulose and insulin. These treatments should be given in cases of icterus and in other disturbances of the liver, in addition to the other therapeutic measures that may be required. The patient should receive twice daily from 10 to 30 units of insulin. After that from 20 to 30 Gm. of levulose should be administered perorally, or in the form of retention enemas or intravenously. The diet in diseases of the liver should be rich in carbohydrates but deficient in proteins.

Edema with Anuria and Death from Uremia Without Nephritis.—Klein and Nonnenbruch report the case of a man, aged 42, who four years previously, in 1924, had contracted syphilis, and at that time had undergone injection treatments. Although the Wassermann reaction was still positive, syphilitic symptoms could no longer be detected. In November, 1928, the patient developed edema. Gradually the entire body became edematous, and he was brought to the hospital. Examination of the heart and kidneys revealed no etiologic factors for the edema and the oliguria. The latter gradually developed into a complete anuria. Decapsulation of the left kidney and other therapeutic measures were of no avail and the patient died of uremia. Neither the test of the urine nor the histologic examination of the kidney revealed symptoms that are characteristic for nephritis. Hypertension was not observed. Slight hypertrophy and dilatation of the right and left ventricles indicated that hypertension had perhaps existed in the earlier stages of the disease. The authors point out that if acute, diffuse glomerular nephritis is considered a constitutional disease in which nephritis as a part symptom may be missing, then the case reported may be regarded as a dropsical form of this "acute diffuse glomerular nephritis."

Temporary Mental Disturbances Caused by Liver Therapy in Pernicious Anemia.—Taterka and Goldmann give a short review of the literature on the harmful effects of liver therapy. They then report their own observations on five patients. From four to six days after the liver therapy was begun, the patients appeared somnolent, sometimes excited and always somewhat confused. The general aspects of the disease indicated a life endangering exacerbation. This condition lasted two or three days. Then marked improvement became noticeable. The authors direct attention to the fact that these patients received comparatively large quantities of liver. Each patient was given a daily dose of liver extract equal to 1,400 Gm. of raw liver and besides this received fresh liver. Healthy persons and patients with a slight degree of anemia did not show these mental disturbances when given the same large quantities. The authors point out that during the latent stage, that is in periods before the liver treatment becomes effective, the hemoglobin content decreases still more. They think that the mental disturbances may be due to the fact that the large quantities of liver cause a more sudden and a stronger reduction in the hemoglobin. The authors conclude that, although large quantities of liver cause temporary mental disturbances, they have no other harmful effects and the mental disturbances should not be taken as a contraindication to the continuation of the liver therapy. On the contrary, these large doses are to be recommended, because they bring good results in apparently hopeless cases and render blood transfusions unnecessary.

Therapeutic Value of Ultraviolet Rays in Treatment of Gallstones.—Lorand points out that the prevention of colic should be the main object in the treatment of gallstones. Local application of heat to the region of the gallbladder is one of the most effective means of counteracting the pains. Twenty-five years' experience in Karlsbad convinced the author that the drinking of Karlsbad water alone is not effective. In combination with the drinking cure he recommends the application of hot, radioactive mud packs and irradiation with the quartz lamp. If this method is applied for from three to four weeks and if the patient receives sufficient rest, the painfulness disappears; this indicates that the inflammation has improved and that colics are less likely to occur. The ultraviolet irradiation showed not only local effects but also had a favorable influence on the general condition. The authors explain this as being due to the fact that quartz lamp treatments stimulate the function of the glands of internal secretion.

Münchener medizinische Wochenschrift, Munich

76: 1745-1784 (Oct. 18) 1929

Evidence That Vitamin A is Necessary for Growth of Fetus. E. Vogt.—p. 1748.
*Increased Carcinolytic Capacity of Serum of Patients with Cancer After Irradiation with Quartz Lamp and After Injection of Spleen Extracts. H. Zacherl.—p. 1750.
Treatment of Ovarian Insufficiency with Sex Hormone. H. Siebke.—p. 1752.
*Levulose and Insulin in Treatment of Severe Diabetic Ketosis. O. Pucsko.—p. 1755.
Statistical Report on Frequency of Gonorrhea. A. Buschke and E. Kaufmann.—p. 1757.
Infectious Diseases and Injections with Animal Serums as Cause of Positive Syphilis Reactions in Man. Wichels, Hürthle and Maley.—p. 1759.
Hyperchromatic Anemia in Intestinal Diseases. H. Glatzel.—p. 1760.
Influence of Venesection on Detachment of Retina. W. Jablonski.—p. 1762.

Increased Carcinolytic Capacity of Serum of Patients with Cancer After Irradiation with Quartz Lamp and After Injection of Spleen Extracts.—Zacherl observed that if patients with cancer are irradiated with the quartz lamp, the carcinolytic power of the serum increases. He thinks that this is caused by an increased activity of the reticulo-endothelial system. The carcinolytic capacity shows an even greater increase after the injection of spleen extracts, whereas extracts of other organs have no effect whatever on this property of the serum. The author thinks that the specific action of the spleen may be explained by the significant rôle of this organ in the reticulo-endothelial system.

Levulose and Insulin in Treatment of Severe Diabetic Ketosis.—Instead of dextrose Pucsko employed levulose in counteracting ketonemia and ketonuria in diabetic patients. He administered levulose either intravenously or perorally, and then he determined the quantity of acetone bodies in the blood and in the urine. Later he combined the levulose treatments with insulin injections. For the intravenous injection of levulose he used 20 cc. of a 50 per cent solution, and from 20 to 40 units of insulin was administered subcutaneously before, simultaneously with, or after the levulose injection. The author also tried the intravenous injection of a mixture of insulin and levulose. In the latter experiments, however, not more than 20 units of insulin was given. As evidence of the effectiveness of the levulose and insulin treatments, the author gives detailed descriptions of four cases in which he employed this therapy. These reports indicate that intravenous injections of levulose in combination with insulin treatments are effective, especially for diabetic patients with severe ketonemia and ketonuria. Several of these patients had been treated previously with insulin. However, the insulin injections alone did not have the desired effect on the ketosis. Peroral administration of levulose in combination with insulin injections likewise proved effective, only the results were somewhat retarded. The author also observed an increase in weight in several patients who received the combined levulose and insulin treatments. He thinks that sweet fruits, which contain large quantities of levulose, should be included in the diabetic diet.

Wiener klinische Wochenschrift, Vienna

42: 1341-1372 (Oct. 17) 1929

Ultravisible Forms of Tubercle Bacillus. E. Loewenstein and E. Singer.—p. 1341.
*Hyperthermia by Means of Hot Air as Substitute for Fever Therapy. H. Kahler and F. Knollmayer.—p. 1342.
Plaut-Vincent's Angina: Its Various Types, Blood Pictures and Treatments. J. Zikowsky.—p. 1344.
Causes of Rupture of Ovarian Tumors. E. Herrmann.—p. 1350.
*Influence of Ultraviolet Rays on Bactericidal Power of Inflammatory Exudates. J. Skursky.—p. 1351.
Colposcopic Picture in Early Superficial Cancer of Cervix. E. Preissecker.—p. 1352.
*Relation Between Respiration and Peristalsis of Stomach: A Respiratory Reflex and Its Clinical Significance. S. Plaschkes.—p. 1353.
Complete Closure of Anastomosis as Result of Plastic Peritonitis. K. Blond.—p. 1355.
Difficulties in Differential Diagnosis in Surgical Conditions. J. Schnitzler.—p. 1355.
Newer Surgical Tendencies in Diseases of Endocrine Glands. F. Mandl.—p. 1357.
Occurrence and Treatment of Adherent Labia Minora in Infants and Small Girls. R. Lederer.—p. 1362.
Ocular Disturbances as Causes of Headache. G. Guist.—p. 1363.

Hyperthermia by Means of Hot Air as Substitute for Fever Therapy.—Kahler and Knollmayer point out that in recent years malaria treatments and other forms of pyretotherapy have supplanted the older physical methods for producing fever. The authors followed Walinski's suggestion of producing fever by means of hot baths. The water had a temperature of from 105 to 107 F., and the bath lasted from ten to twelve minutes. In order to maintain the heightened temperature longer, the patient was given an intravenous injection of 10 cc. of a 20 per cent solution of sodium chloride two minutes before the bath. Immediately after the bath he was wrapped in several blankets. With this method it was possible to produce fever up to 104 F. A temperature of 99.5 F. was maintained for about eight hours. The authors found that the therapeutic results could be improved by prolonging the external application of heat. Consequently they followed the hot bath by hot air treatments lasting from one half to two hours. Later the hot baths and the injection with the solution of sodium chloride were omitted and the patients received only the hot air treatments by means of the incandescent lamp. A greater increase in temperature was sometimes effected by the injection of 1 mg. of atropine. The authors employed this method in thirty cases. The treatments were given after intervals of from two to six days and each patient received from six to twelve injections. Good results were obtained in cases of paresis, tabes dorsalis, multiple sclerosis and especially chronic arthritis deformans. However, parkinsonism could not be influenced. In one case of syphilitic mesaortitis with frequent stenocardiac attacks, it was possible to counteract the attacks by means of hyperthermia. The authors conclude that this treatment not only is a valuable substitute for malaria inoculation and other forms of pyretotherapy but has the advantage of being entirely harmless.

Influence of Ultraviolet Rays on Bactericidal Power of Inflammatory Exudates.—Skursky directs attention to the fact that other authors have demonstrated the bactericidal power of inflammatory exudates. He then reports his own experiments on exudates from the pleura, the abdomen and the joints. The exudates were inoculated with cultures of the anthrax bacillus and it was found that they had bactericidal power. Experiments with colon bacilli, staphylococci and streptococci showed that the exudates have no bactericidal action on these micro-organisms. In order to determine whether the bactericidal power of the exudates may be increased, the author irradiated the exudates with the quartz lamp. Irradiation was applied for fifteen minutes at a distance of 30 cm. In comparing the bactericidal power of the exudates before and after irradiation, it was found that the ultraviolet rays increase this property. It was also noted that the bactericidal power of the different exudates varies somewhat. The author assumes that this is due to the number of cells. He also noted that although the bactericidal power of the exudates against anthrax bacilli is increased after irradiation, changes cannot be noted in the effect on colon bacilli, on staphylococci or on streptococci. Tests on noninflammatory exudates do not show bactericidal power either before or after irradiation.

Relation Between Respiration and Peristalsis of Stomach: A Respiratory Reflex.—Plaschkes observed peristalsis in the stomach with the aid of the roentgen apparatus. He noted that deep breathing stimulates peristalsis, so that the contents of the stomach empty more rapidly into the duodenum. The author explains the mechanism of this reflex and then he discusses its clinical significance. After a heavy meal it may be observed that a person takes a deep breath in order to overcome the feeling of fulness. The reflex also extends to the subdiaphragmatic portion of the esophagus. Deep breathing sets in almost automatically, whenever the esophagus becomes obstructed by a large particle of food, and the increased peristalsis forces the morsel down. In roentgenoscopy of the stomach a knowledge of this reflex is significant for differentiation between nervous pylorospasm and the pylorospasm that is symptomatic of ulcer. A spasm of nervous origin can be overcome by deep breathing. However, the respiration has no effect on symptomatic pylorospasm. The reflex also explains the sighing and yawning respiration in nervous patients with gastric disturbances. These persons frequently have pylorospasm, and deep inspiration counteracts this. The author mentions several other reflexes that may be explained in a similar manner.

Zeitschrift für Urologie, Leipzig

23: 833-912, 1929

*New Stylet for Ureteral Catheter. O. Hennig.—p. 833.
*Closed Tuberculosis of One Kidney. A. Schmidt.—p. 834.
Nervous Atony of Bladder and Ureter. L. Zeiss.—p. 839.
*Decapsulation of Kidney. K. Hegedüs.—p. 847.
Idiopathic Left-Sided Varicocele. O. L. Smirnoff.—p. 850.
Treatment in Infections of Urinary Tract. H. W. E. Walther.—p. 859.
*Treatment in Ureteral Calculi. W. Schöndube.—p. 865.
New Cystoscope Holder. F. B. Rüder.—p. 890.
Roentgen Demonstration of Parenchyma and Pelvis of Kidney. T. Hryntschak.—p. 893.

New Stylet for Ureteral Catheter.—Hennig gives an illustrated description of a new, flexible, metallic stylet which simplifies the propulsion of a ureteral catheter and is especially valuable in prolonged cystoscopy with ureteral catheterization for observation of the secretion of urine or the excretion of indigo carmine.

Treatment of Closed Tuberculosis of One Kidney.—Schmidt emphasizes the danger of closed tuberculosis of the kidney and the importance of as radical removal of the kidney in this condition as in open tuberculosis. When tuberculosis of the kidney changes from the open to the closed form, the tuberculous changes in the bladder disappear just as they do following the removal of the kidney during the stage of open tuberculosis; with them goes the danger of ascending infection of the other kidney. However, years are required for the calcification of

the caseous tuberculous masses and the destruction of all the tubercle bacilli. During this long period of time there is danger of paranephric abscess and of hematogenous and lymphogenous metastasis of the tuberculosis to other parts of the body, particularly the lung, the spinal column and the healthy kidney.

Decapsulation of Kidney.—Hegedüs reports the case of a youth, aged 19, in whom decapsulation of a remaining kidney in complete anuria, three months following resection of the other kidney for tuberculosis, saved the life of the patient.

Treatment in Ureteral Calculi by Means of Extract of Posterior Lobe of Hypophysis.—In thirteen of twenty-one cases of ureteral calculi, Schöndube was able to expel the calculus by means of an extract of the posterior lobe of the hypophysis. Injurious effects of this form of treatment were not observed. When the calculus was in the lower segment of the ureter it was frequently passed without colic. Cystoscopic examination in sixteen cases revealed that, provided a severe cystitis with involvement of the muscular layer of the ureters was not present, the injection of extract of the posterior lobe of the hypophysis was followed by increased peristalsis in the ureters. The frequency and strength of the retractive movements of the ureter were increased threefold; even the presence of an impacted stone did not prevent the increase in the retractive movements. The simultaneous subcutaneous administration of atropine inhibits the action of the hypophyseal extract but its simultaneous peroral administration has only a slight inhibitory effect. Morphine decreases the frequency of the movements and causes the peristalsis to become irregular and spasms to appear. Anesthetization of the ureters and parasacral anesthesia do not block the action of the extract. The simultaneous administration of extract of hypophysis and of fluids is purposeless because as a result of the inhibition of diuresis the fluid is not excreted. A series of diuretic drugs from various groups did not suppress the inhibition of the excretion of fluid. However, combined treatment with extract of the posterior lobe of the hypophysis and with the administration of fluids several hours later or on days that the extract is not administered gives excellent results.

Zentralblatt für Chirurgie, Leipzig

56: 2561-2624 (Oct. 12) 1929

*Oxygen Inhalations in Pulmonary Embolism. G. Lotheissen.—p. 2563.
*End-Results of Covering Amputation Stumps with Free Fascia Transplants. C. Ritter.—p. 2565.
Chronic Thyreoiditis. H. Hellner.—p. 2566.
*Use of Boric Acid as a Surgical Antiseptic. E. Vertán.—p. 2570.
*Treatment of Hemorrhage from Acute Gastric Ulcer. H. Bock.—p. 2575.
Foreign Body (Piece of Bone) Perforates Herniated Small Intestine. H. Ackermann.—p. 2577.
*Fatal Embolism Following Injection of Varicose Veins of Leg. W. Kühnau.—p. 2580.

Oxygen Inhalations in Cases of Embolism of the Lung.—Lotheissen stresses the value of inhalations of pure oxygen in every case of pulmonary embolism. In some cases it may be combined to good advantage with heart massage and artificial respiration. He cites the case of a young woman who on the tenth day after an appendectomy suddenly manifested symptoms of pulmonary embolism. Inhalations of oxygen were given immediately with cardiac stimulants. The patient recovered promptly but when the oxygen was discontinued, collapse symptoms supervened. Therefore, the inhalations were administered continuously for three days, when they were no longer needed. The source of the embolus was from one of the arteries of the leg where the thrombosis was evidenced by swelling of the extremity.

Use of Fascia Transplants to Cover Amputation Stumps.—Ritter reports a case of amputation of the femur in which he covered the end of the bone with strips of fascia, suturing these to the periosteum. About a year and a half later the patient returned because of the presence of painful exostoses at the end of the stump. At the second operation it was noted that the fascia had been converted into a hard firm sheet or plate which covered the end of the stump effectively. Overlying this plate was a layer of tissue resembling periosteum.

Use of Boric Acid as a Surgical Antiseptic.—Vertán has used powdered boric acid, in 15 to 30 Gm. doses, in many hundreds of cases as a prophylactic and antiseptic with uniformly good results. He has used it in serous cavities, abscesses, open wounds and on mucous surfaces without any untoward effect in a single case. Toxic effects were never observed. It induces a slight hyperemia which favors healing. Occasionally a slight erythema of the skin followed the application, especially in children, but was of no consequence. As a prophylactic it was used in cases in which the possibility of infection of the wound could not be excluded as compound fractures and head injuries with involvement of the dura. As an antiseptic it was efficacious in the treatment of suppurating wounds, gangrene, necrotomy wounds, abscesses, suppurative peritonitis, after the removal of a suppurating kidney—in fact, in any suppurative process in any part of the body. Infective processes were combated quickly and healing was promoted.

Treatment of Bleeding Gastric Ulcer.—Bock favors active intervention in all cases of profusely bleeding gastric ulcers. The transfusion of blood should be followed by operation under splanchnic anesthesia. In some cases excision of the ulcer suffices; in others, gastro-enterostomy with occlusion of the pylorus, and in still others jejunostomy, should be performed. The author believes that such procedures will save many lives.

Fatal Embolism Following Injection of Varicose Veins.—Kühnau relates the case of a man who was given an injection for varicose veins of the leg. The substance used was unknown to the patient. He remained in bed for four days. He was then discharged and told that he need not observe any special precautions. Soon afterward he had severe pains in the leg and manifested symptoms of pulmonary embolism. At the site of the injection the vein was hard and swollen, and firmly thrombosed, with signs of inflammation just above. Pulmonary embolism was diagnosed. On the following day a second embolus evidently lodged in the lung and to this the patient succumbed very quickly. Kühnau regards this treatment as being very dangerous and is convinced that many similar instances occur but are not recorded. He suggests that in order to prevent extensive thrombosis proximal to the injection it is advisable to constrict the vein. In any event the utmost caution in making these injections should be observed.

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72: 909-918 (Sept. 5) 1929

*Fractures of Head and Neck of Radius. E. Lassen.—p. 909.

Fractures of Head and Neck of Radius.—Lassen discusses these fractures on the basis of seventy-one cases of fracture of the upper part of the radius in 2,457 cases of fracture in the upper extremities (2.9 per cent). In sixty-three cases the treatment was conservative, in eight, operative. After-examination was made in fifty-seven cases, including the operative. Of those treated conservatively the functional result was good in thirty-one, fairly good in fourteen and poor in four; only three of these patients were seriously handicapped in their work because of the pain. The operative results were not particularly good, but operation was done only in grave fractures and in all but one case, late.

72: 931-942 (Sept. 19) 1929

*Free Grafting of Endometrium into Peritoneum in Guinea-Pigs. E. Dahl-Iversen.—p. 931.

Free Grafting of Endometrium into Peritoneum in Guinea-Pigs.—Dahl-Iversen asserts that neither the results of his investigations in animals here reported nor those published in the literature support Sampson's theory of endometriosis. The endometrium introduced into the peritoneal cavity becomes implanted in the pelvis and the sites characteristic for human endometriosis only because the greatest trauma occurred in these regions. Unless the menstrual blood possesses particularly irritative qualities, the escape of blood into the peritoneal cavity cannot produce the lesion of the serous membrane necessary for an implantation of endometrium.

72: 943-952 (Sept. 26) 1929

*Isolated Tubal Torsion. H. K. Lassen.—p. 947.

Isolated Tubal Torsion.—In Lassen's case in a girl, aged 15, previously well, laparotomy revealed a hematosalpinx with torsion of 360 degrees in the peduncle. Removal of the oviduct and a Meckel's diverticulum was done, with entero-anastomosis. The patient died two and a half days later in hyperpyrexia; the cause of death was not determined. The tube was normal.